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KEY

KEY

TO

SCHOOL CLASS BOOK OF ARITHMETIC.

PART I.

Cambridge:
PRINTED BY C. J. CLAY, M.A.
AT THE UNIVERSITY PRESS.

KEY

TO

SCHOOL CLASS BOOK

OF

ARITHMETIC.

PART I.

BY

BARNARD SMITH, M.A.

RECTOR OF GLASTON, RUTLAND, LATE FELLOW AND SENIOR BURSAR OF ST PETER'S COLLEGE, CAMBRIDGE.

Cambridge and London:

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SOLUTIONS, &c.

NOTATION.—Ex. I. Page 5.

1. (1) 4, 7, 9, 11, 14, 15, 20, 18, 26, 29.

(2) 63, 47, 90, 38, 53, 31, 55, 13, 40.

(3) 100, 107, 191, 116, 154, 188, 208, 330, 809, 999, 602, 459.

(4) 3000, 1356, 4010, 9007, 8874, 5001.

(5) 20000, 33059, 78604, 50050, 97900, 63707.

(6) 300030, 904249, 710106, 2000000, 4403240, 9009009, 30000003, 108108000, 2350067789, 2000002002002, 54000103000047.

NUMERATION.

2. (1) Three, seven, ten, eight, thirteen, seventeen, four, nineteen, twenty-six.

(2) Fifty-three, thirty, seventy-three, thirty-five, twenty-four, forty-two, ninety-one, eighty-eight, twenty-nine.

(3) One hundred, one hundred and five, two hundred and twenty, six hundred and eleven, two hundred and forty-eight, three hundred and sixty-four, three hundred and thirty-three.

(4) Six hundred and sixteen, nine hundred and ninety, eight hundred and seven, eight hundred and thirty-five, one hundred and nineteen, seven hundred and eighty-one, six hundred.

(5) Two thousand, one thousand and two, two thousand and ten, two thousand and sixty, five thousand five hundred, four thousand six hundred and seventy-three.

(6) Seven thousand and forty, nine thousand eight hundred and seventy-six, one thousand eight hundred and two, five thousand and six, one thousand one hundred and nineteen, six thousand two hundred and thirty.

(7) Fifty-four thousand three hundred and twenty-one, twenty-one thousand and twenty-six, one hundred and two thousand nine hundred and one, forty-five thousand and six, seven hundred and fourteen thousand two hundred and thirty-six.

(8) Eighty thousand eight hundred and eight, nine hundred thousand, three hundred and one thousand five hundred, one million and nineteen, ten millions ten thousand and twenty-eight.

(9) Five hundred and forty-three thousand and six, four millions one hundred and eighty-three thousand two hundred and one, three hundred and eight millions six hundred and two thousand six hundred and seventy-one, one hundred and twenty-three millions four hundred and fifty-six thousand seven hundred and eighty-nine.

(10) Three hundred and fifty millions six hundred and forty-seven thousand three hundred and twenty-one, twenty-four millions three thousand six hundred and one, nine hundred thousand millions and nine, four hundred and ninety thousand eight hundred and seventy millions two hundred and twenty-two thousand and twenty-two.

SIMPLE ADDITION.—Ex. II. Page 9.

(1) 8; 8; 10; 12; 21; 17; 16; 14; 18; 25; 26; 32; 40; 36.

(2) 36; 81; 68; 192; 160; 162.

(3) 43. (4) 50. (5) 91. (6) 77.

(7) 1846; 2628; 2858; 2153; 3101.

(8) 10859; 20851; 20668; 25930.

(9) 2953205; 4387219; 3598454.

(10)

724	713068	563
46	920	96009
18	48543	500002
1341	26	4025395
905	5004	
600	2167003	4621969
27		
	2934564	
3661		

(11) (12)

(13)

bus.	
6705	1st cargo,
77280	2nd .....
590046	3rd .....
128386	4th .....
6870	5th .....
67084	6th .....
103966	7th .....
980337	

(14)

1817	
69	
1886	

The man will be 69 years of age in the year 1886

(15) Week's receipts $= £\{9+15+(9+15)+18+(15+18+3)+(9+15+24+18)\} = £168.$

(16)

	Apples		Apples.
A's bag contained	684	*A*'s basket	1053
B's	1053	*B*'s	1737
C's	2438		2790
	4175		

$\therefore$ No. of apples picked up $= 4175 + 2790 = 6965.$

SIMPLE SUBTRACTION.—Ex. III. Page 13.

(1) 314. (2) 222. (3) 118. (4) 492.

(5) 1869. (6) 5921. (7) 1708. (8) 218025.

(9) 1859881. (10) 195899949. (11) 7490193467.

(12) 2971846892.

(13)
$$\begin{array}{r} 3322506 \\ 900760 \\ \hline 2421746 \end{array}$$

(14)
$$\begin{array}{r} 1300004 \\ 9027 \\ \hline 1290977 \end{array}$$

(15)
$$\begin{array}{r} 1784 \\ 1709 \\ \hline 75 \text{ years.} \end{array}$$

(16)
$$\begin{array}{r} 6764+3764=10528 \\ 6500+2341=\ 8841 \\ \hline 1687 \end{array}$$

(17)
$$\begin{array}{r} 7562-3876=3686 \\ 1734+\ 305=2039 \\ \hline 1647 \end{array}$$

(18) Cost of Estates $= £\{5260+3585+(5260+3585)\}$
$= £17690,$
$\therefore$ loss $= £(17690-15280) = £2410.$

(19)
$$\begin{array}{r} 365027045 \\ 73105 \\ \hline 364953940 \end{array}$$

Three hundred and sixty-four millions nine hundred and fifty-three thousand nine hundred and forty.

(20) $10000+64-7349+555-458 = 10064-7349+555-458$
$= 2715+555-458$
$= 3270-458$
$= 2812$

$409-263-56+999 = 146-56+999$
$= 90+999$
$= 1089$

$\therefore$ diff. $= 2812-1089 = 1723.$

ROMAN NOTATION.—Ex. IV. Page 15.

1. VII; XI; XVIII; XIX; XXXV; LV; LIX; CXXVIII; CCCXXVII; DCCIX; MM or $\overline{\text{II}}$; MDCCLXIV.

2. Eight, 8; twenty-nine, 29; one hundred and twenty-two, 122; one thousand five hundred and sixty-two, 1562; five thousand and two, 5002; one million one hundred thousand, 1100000.

SIMPLE MULTIPLICATION,
when the Multiplier is a number not larger than 12.

Ex. V. Page 17.

(1)	90604.	(2)	1381470.	(3)	437158.
(4)	155210600.	(5)	173688.	(6)	146019.
(7)	72177.	(8)	142276.	(9)	138268.
(10)	283545.	(11)	3209935.	(12)	538236.
(13)	4771854.	(14)	3355163.	(15)	6240801.
(16)	3907832.	(17)	4069592.	(18)	59122215.
(19)	60302592.	(20)	72035000.	(21)	5258836.
(22)	8418575.	(23)	9584676.	(24)	57166500.
(25)	41411844.	(26)	13125.		

(27) Distance apart at end of 1st hour $= 23 + 4$ or 27 m.
$\therefore$ ..... 9 hours $= 27 \times 9$ or 243 m.

(28) 153; 6051.

(29) No. of lemons bought
$= 28 \times 12 + (19 \times 12 + 5) + (33 \times 12 + 9)$
$= 336 + 228 + 5 + 396 + 9 = 974$;
$\therefore$ lemons cost 974 pence;
No. of sound lemons $= 974 - 37 - 84 = 937 - 84 = 853$,
$\therefore$ lemons sold for (853×2) or 1706 pence,
$\therefore$ gain $= (1706 - 974)$ pence $= 732$ pence.

(30) No. of plums $= 29 \times 12 + 24 \times 9 + 37 \times 12 + 27$
$= 348 + 216 + 444 + 27 = 1035$.

SIMPLE MULTIPLICATION,
when the Multiplier is a number larger than 12.

Ex. VI. Page 22.

(1)	463	(2)	798	(3)	805	(4)	885
	45		37		86		29
	2315		5586		4830		7965
	1852		2394		6440		1770
	20835		29526		69230		25665

(5) 734 × 60 = 44040

(6) 682 × 55 = 3410 + 3410 = 37510

(7) 3094 × 104 = 12376 + 3094 = 321776

(8) 1987 × 329 = 17883 + 3974 + 5961 = 653723

(9) 7071 × 506 = 42426 + 35355 = 3577926

(10) 8340 × 650 = 417000 + 5004 = 5421000

(11) 57096 × 478 = 456768 + 399672 + 228384 = 27291888

(12) 800986 × 530 = 24029580 + 4004930 = 424522580

(13) 902468 × 5008 = 7219744 + 4512340 = 4519559744

(14) 73086413 × 38706 = 438518478 + 511604891 + 584691304 + 219259239 = 2828882701578

(15) 5988050 × 97200 = 1197610000 + 4191635 + 5389245 = 582038460000

(16) 4687053 × 59074 = 18748212 + 32809371 + 42183477 + 23435265 = 276882968922

(17) 256841 × 83528 = 2054728 + 513682 + 1284205 + 770523 + 2054728 = 21453415048

(18)

74863500
8470150

3743175000
748635
5240445
2994540
5989080

634105074525000

(19)

1754
9306

10524
5262
15786

16322724

47506
4500

28753000
190024

213777000

149570
15790

13461300
104699
74785
14957

2361710300

554768
39314

2219072
554768
1664304
4992912
1664304

21810149152

815085
20048

6520680
3260340
1630170

16340824080

123456789
987654321

123456789
246913578
370370367
493827156
617283945
740740734
864197523
987654312
1111111101

121932631112635269

57298492692
700809050321

57298492692
114596985384
171895478076
286492463460
515686434228
458387941536
401089448844

40155302248305278754132

(20)

9487352
4731246

56924112
37949408
18974704
9487352
28462056
66411464
37949408

44886996200592

38015732
400700065

190078660
228094392
266110124
152062928

15232906283422580

574585614865
2837154309

5171270533785
1723756844595
2298342459460
2872928074325
574585614865
4022099304055
1723756844595
4596684918920
1149171229730

1630183053103649203285

4342760
599999

39084840
39084840
39084840
39084840
39084840
21713800

2605651657240

17376872
7399078

139014976
121638104
156391848
156391848
52130616
121638104

128572831324016

(21) 650090
3008

5200720
1950270

1955470720

76008765
9009009

684078885
684078885
684078885

684763647963885

(22) 12
17

84
12

204
19

1836
204

3876

3781
3782

7562
30248
26467
11343

14299742
3783

42899226
114397936
100098194
42899226

54095923986

6565	(23) 20470	2958
6786	1030	476
39390	614100	17748
52520	20470	20706
45955	21084100	11832
39390		1408008
44550090		
9898		
356400720		
400950810		
356400720		
400950810		
440956790820		

(24) No. of mi. $= (16 \times 6 \times 52) = (96 \times 52) = 4992$,
No. of shillings earned $= (6 \times 52 \times 2) = 624$.

(25) Each pauper costs £37 − £28 = £9,
∴ whole cost = £(6078×9) = £54702.

(26) No. of elms in 37 yrs. $= 56354 \times 25 + 56354 \times 2 \times 12$
$= 1408850 + 1352496$
$= 2761346$.

No. of elms in 100 yrs. $= 56354 \times 25 + 56354 \times 50 + 56354 \times 3 \times 50$
$= 1408850 + 2817700 + 8453100$
$= 12679650$.

SIMPLE DIVISION,
when the Divisor is a number not larger than 12.

Ex. VII. Page 26.

1. (1) 2) 6 (3; 2) 14 (7; 2) 9 (4 rem. 1; 2) 23 (11 rem. 1.

(2) 3) 15 (5; 3) 11 (3 rem. 2; 3) 27 (9; 3) 32 (10 rem. 2.

(3) 4) 30 (7 rem. 2; 4) 44 (11; 4) 18 (4 rem. 2; 4) 39 (9 rem. 3.

(4) 5) 20 (4; 5) 53 (10 rem. 3; 5) 44 (8 rem. 4; 5) 37 (7 rem. 2.

(5) 6) 18 (3; 6) 55 (9 rem. 1; 6) 37 (6 rem. 1; 6) 70 (11 rem. 4.

(6) 7) 42 / 6; 7) 24 / 3 rem. 3; 7) 70 / 10; 7) 55 / 7 rem. 6.

(7) 8) 56 / 7; 8) 68 / 7 rem. 7; 8) 94 / 11 rem. 6; 8) 89 / 11 rem. 1.

(8) 9) 45 / 5; 9) 22 / 2 rem. 4; 9) 58 / 6 rem. 4; 9) 96 / 10 rem. 6.

(9) 10) 86 / 8 rem. 6; 11) 76 / 6 rem. 10; 11) 94 / 8 rem. 6; 12) 108 / 9.

2. (1) 2) 624 / 312. (2) 2) 47836 / 23918. (3) 2) 55798 / 27899.

(4) 3) 3693 / 1231. (5) 3) 8964 / 2988. (6) 4) 4840 / 1210.

(7) 4) 49716 / 12429. (8) 4) 44028 / 11007 (9) 5) 624602 / 124920 rem. 2.

(10) 5) 952786 / 190557 rem. 1. (11) 6) 481974 / 80329.

(12) 6) 3587400 / 597900. (13) 7) 295613 / 42230 rem. 2.

(14) 7) 797345 / 113906 rem. 3. (15) 8) 431720 / 53965.

(16) 8) 1234567 / 154320 rem. 7. (17) 9) 87654321 / 9739369.

(18) 9) 569008721 / 63223191 rem. 2. (19) 10) 88888888 / 8888888 rem. 8.

(20) 11) 870802563 / 79163869 rem. 4. (21) 11) 721374800 / 65579527 rem. 3.

(22) 12) 26730002176 / 2227500181 rem. 4. (23) 12) 1457265172 / 121438764 rem. 4.

(24) 12) 1548154815 / 129012901 rem. 3.

(25) Cost per mile = £36948 ÷ 12 = £3079.

(26) No. = 630 ÷ 6 = 105; No. = 630 ÷ 9 = 70.

(27) No. = 1098300 ÷ 12 = 91525.

(28) Divisor = (7832456 − 8) ÷ 8 = 7832448 ÷ 8 = 979056.

(29) (1608 − 125) ÷ 11 = 1483 ÷ 11 = 134 rem. 9,
∴ each boy has 134 nuts.

(30) Quotient = 1000064030087 ÷ 12 = 83338669173 rem. 11.

SIMPLE DIVISION,
when the Divisor is a number larger than 12.

Ex. VIII. Page 33.

1. (1) 16) 384 (24
32
64
64

13) 1794 (138
13
49
39
104
104

22) 946 (43
88
66
66

2,0 | 23456,0
11728

(2) 23) 1035 (45
92
115
115

26) 2522 (97
234
182
182

83) 3071 (37
249
581
581

6,0 | 204,6
34 rem. 6

(3) 83) 23074 (278
166
647
581
664
664

256) 88832 (347
768
1203
1024
1792
1792

569) 175252 (308
1707
4552
4552

3,0 | 784,1
261 rem. 11

(4) 307) 93635 (305
921
1535
1535

365) 2054950 (5630
1825
2299
2190
1095
1095

738) 560142 (759
5166
4354
3690
6642
6642

(5) 14) 8695120 (621080
84
29
28
15
14
112
112

46) 4015708 (87298
368
335
322
137
92
450
414
368
368

99) 2662605 (26895
198
682
584
886
792
940
891
495
495

(6) 51) 51173553 (1003403
51
173
153
205
204
153
153

112) 81721248 (729654
784
332
224
1081
1008
732
672
604
560
448
448

108) 969466644 (8976543
864
1054
972
826
756
706
648
586
540
464
432
324
324

(7) 817) 72184401 (88353
6536
6824
6536
2884
2451
4330
4085
2451
2451

581) 2066617 (3557
1743
3236
2905
3311
2905
4067
4067

75,0) 502564050,0 (6700854
450
525
525
640
600
405
375
300
300

(8) 907) 536819741 (591863
4535
8331
8163
1689
907
7827
7256
5714
5442
2721
2721

615) 433418175 (704745
4305
2918
2460
4581
4305
2767
2460
3075
3075

```
999 ) 27396576 ( 27424
      1998
      7416
      6993
       4235
       3996
        2397
        1998
         3996
         3996
```

```
(9) 1008 ) 2868835536 ( 2846067
           2016
            8528
            8064
             4643
             4032
              6115
              6048
               6753
               6048
                7056
                7056
```

```
8435 ) 70935237485 ( 8409631
       67480
        34552
        33740
         81237
         75915
          53224
          50610
           26148
           25305
            8435
            8435
```

```
1579,0 ) 236171030,0 ( 149570
         1579
          7827
          6316
           15111
           14211
            9000
            7895
             11053
             11053
```

```
(10) 7575 ) 5738062500 ( 757500
            53025
             43556
             37875
              56812
              53025
               37875
               37875
```

```
3851 ) 57111104051 ( 14830201
       3851
        18601
        15404
         31971
         30808
          11630
          11553
           7740
           7702
            3851
            3851
```

5068) 397386785824 (78410968
35476
42626
40544
20827
20272
5558
5068
49058
45612
34462
30468
40544
40544

(11) 37009) 3482569401472 (94100608
333081
151759
148036
37234
37009
225014
222054
296072
296072

22222) 20000000000000000 (900009000090
199998
200000
199998
200000
199998
20

2. (1) 1,00000) 920,04578 (
Quotient = 920, rem. 4578.

119,00000) 4670,00000 (39
357
1100
1071
29

Quotient = 39, rem. 2900000.

(2) 74168) 284176488 (3831
222504
616724
593344
233808
222504
112998
74168
38830

Quotient 3831, rem. 38830.

854096) 636385410000000 (745098220
5978672

3851821
3416384

4354370
4270480

8389000
7686864

7021360
6832768

1885920
1708192

1777280
1708192

690880

Quotient 745098220, rem. 690880.

(3) 70080) 48361297170563 (690087003
420480

631329
630720

609717
560640

490770
490560

210563
210240

323

Quotient 690087003, rem. 323.

98576) 869897518926451 (9296160542
842184
277135
187152
899831
842184
576478
561456
150229
93576
566532
561456
507664
467880
397845
374304
235411
187152
48259

Quotient 9296160542, rem. 48259.

(4) 687637943) 3968901531620 (5771
3438189715
530711816 6
4813465601
4936525652
4813465601
1230600510
687637943
542962567

Quotient 5771, rem. 542962567.

707066) 565700886154628 (800068008
5656528
4808615
4242396
5662194
5656528
5666628
5656528
10100

Quotient 800068008, rem. 10100.

3. $12 \begin{cases} 4 \mid 2371 \\ 3 \mid \overline{592} \text{ rem. } 3 \\ \overline{197} \text{ rem. } 1 \end{cases}$

$\therefore$ quotient = 197, rem. $4 \times 1 + 3$, or 197, rem. 7.

$$72 \begin{cases} 9 \mid 93051 \\ 8 \mid \overline{10339} \text{ rem. } 0 \\ \overline{1292} \text{ rem. } 3 \end{cases}$$

$\therefore$ quotient = 1292,
rem. $9 \times 3 + 0$, or 27.

4. $11371 \div 137 = 83$, $\therefore$ 83 is the No.

5. Other No. $= 3270069 \div 5423$,

$$\begin{array}{r|l} 5423 & 3270069 \\ & 32538 \\ \hline & 16269 \\ & 16269 \\ \hline & \end{array} \quad 603$$

$\therefore$ No. required = 603.

No. of times $= 61238 \div 312$,

$$\begin{array}{r|l} 312 & 61238 \\ & 312 \\ \hline & 3003 \\ & 2808 \\ \hline & 1958 \\ & 1872 \\ \hline & 86 \end{array} \quad 196$$

$\therefore$ No. of times = 196.

6. $(26 \times 26 - 15 \times 15) \div (26 + 15) = (676 - 225) \div 41 = 451 \div 41$
$= 11 = 26 - 15.$

Divisor $= (537523 - 323) \div 158 = 537200 \div 158$,

$$\begin{array}{r|l} 158 & 537200 \\ & 474 \\ \hline & 632 \\ & 632 \\ \hline & \end{array} \quad 3400$$

$\therefore$ divisor = 3400.

7. Jacket + waistcoat cost 24*s.*
since 1 jacket = 3 waistcoats,
$\therefore$ 3 waistcoats + 1 waistcoat cost 24*s.*
or 4 waistcoats cost 24*s.*
$\therefore$ 1 waistcoat cost $24s. \div 4 = 6s.$
1 jacket = 3 waistcoats $= 6s. \times 3 = 18s.$

8. No. of pounds $= 25000 \div 70 = 2500 \div 7 = 357$, rem. 1,
$\therefore$ 358 pounds must be spun.

9. $(250 + 173) \times (250 - 173) = 423 \times 77 = 32571$,
$\therefore$ quotient $= 32571 \div 47 = 693$.

10.

1987) 9313702853 (4687319		46481
7948		936
13657		278886
11922		139443
17350		418329
15896		43506216
14542		
13909		
6338		
5961		
3775		
1987		
17883		
17883		

$\therefore$ difference $= 43506216 - 4687319 = 38818897$.

11. No. of men in regiment $= 945 - 45 = 900$,
No. of men to each officer $= 900 \div 45 = 20$.

12. Since $(64272 - 48) \div 48$, or $64224 \div 48 = 1338$,
and, $85260 \div 70 = 1218$,
$\therefore$ each policeman in the former has $1338 - 1218$, or 120 persons more to look after than in the latter.

13. Sum of the ages of children
$= (4 \times 6 + 6 \times 2 + 3 \times 8 + 5 \times 4)$ years
$= (24 + 12 + 24 + 20) = 80$ years.
No. of children in the School $= 6 + 2 + 8 + 4 = 20$,
$\therefore$ average age of the children $= 80$ years $\div 20 = 4$ years.

14. Average daily attendance
$= (127 + 109 + 130 + 128 + 131) \div 5$
$= 625 \div 5 = 125$.

REDUCTION OF MONEY.

Ex. IX. Page 43.

1. (1) $\begin{array}{r} d. \\ 9 \\ 4 \\ \hline 36q. \end{array}$ $\begin{array}{r|l} 4 & q. \\ \hline & 36 \\ \hline & 9d. \end{array}$ $\begin{array}{r} s. \\ 17 \\ 12 \\ \hline 204d. \end{array}$ $\begin{array}{r|l} 12 & d. \\ \hline & 204 \\ \hline & 17s. \end{array}$

$\begin{array}{r} £ \\ 26 \\ 20 \\ \hline 520s. \\ 12 \\ \hline 6240d. \end{array}$ $\begin{array}{r|l} 12 & d. \\ \hline & 6240 \\ 2,0 & 52,0s. \\ \hline & £26 \end{array}$

(2) $\begin{array}{r} £ \\ 57 \\ 20 \\ \hline 1140s. \\ 12 \\ \hline 13680d. \\ 4 \\ \hline 54720q. \end{array}$ $\begin{array}{r|l} 4 & q. \\ \hline & 54720 \\ 12 & 13680d. \\ 2,0 & 1140s. \\ \hline & £57 \end{array}$ $\begin{array}{r} guins. \\ 14 \\ 21 \\ \hline 14 \\ 28 \\ \hline 294s. \\ 12 \\ \hline 3528d. \end{array}$

$21 \left\{ \begin{array}{r|l} 12 & d. \\ \hline 3 & 3528 \\ \hline 7 & 294s. \\ \hline & 98 \end{array} \right.$ 14 guins.

$\begin{array}{r} crowns \\ 74 \\ 5 \\ \hline 370s. \\ 12 \\ \hline 4440d. \\ 4 \\ \hline 17760q. \end{array}$ $\begin{array}{r|l} 4 & q. \\ \hline & 17760 \\ 12 & 4440d. \\ 5 & 370s. \\ \hline & 74 \text{ crowns.} \end{array}$

(3) $84fr. = (84 \times 100)c. = 8400c.$
$8400c. = (8400 \div 100)fr. = 84fr.$
$1760fr.\ 5d. = (1760 \times 10 + 5)d. = 17605d. = (17605 \times 10)c.$
$= 176050c.$
$176050c. = (176050 \div 10)d. = 17605d. = (17605 \div 10)fr.$
$= 1760fr.\ 5d.$
$43fr.\ 6c. = (43 \times 100 + 6)c. = 4306c.$
$4306c. = (4306 \div 10)d. = 430d.\ 6c. = (430 \div 10)fr.\ 6c.$
$= 43fr.\ 6c.$

(4) $57fr.\ 4d.\ 5c. = (570+4)d.\ 5c. = 574d.\ 5c. = (5740+5)c.$
$= 5745c.$
$5745c. = (5745 \div 10)d. = 574d.\ 5c. = (574 \div 10)fr.\ 5c.$
$= 57fr.\ 4d.\ 5c.$
$66173fr.\ 14c. = (6617300+14)c. = 6617314c.$
$6617314c. = (6617314 \div 100)fr. = 66173fr.\ 14c.$
$8760fr. = (8760 \times 100)c. = 876000c.$
$876000c. = (876000 \div 100)fr. = 8760fr.$

(5)

s.	d.
8	4
12	
96+4 or 100d.	
4	
400q.	

q.
4 | 400
12 | 100d.
8 rem. 4d.

Ans. 8s. 4d.

s.	d.
19	4½
12	
228+4 or 232d.	
2	
464+1, or 465 half-pence.	

half-pence
2 | 465
12 | 232 rem. ½d.
19 rem. 4d.

Ans. 19s. 4½d.

£	s.	d.
35	4	6
20		
704s.		
12		
8454d.		

d.
12 | 8454
2,0 | 704 rem. 6d.
35 rem. 4s.

Ans. £35. 4s. 6d.

(6)

£	s.	d.
77	16	6¼
20		
1556s.		
12		
18678d.		
4		
74713q.		

q.
4 | 74713
12 | 18678 rem. 1q.
2,0 | 1556 rem. 6d.
77 rem. 16s.

Ans. £77. 16s. 6¼d.

£
84
4
336 crowns.

crowns
4) 336
£84

$10063fr.\ 2c. = (10063 \times 100+2)c. = (1006302)c.$
$1006302c. = (1006302 \div 10)d. = 100630d.\ 2c.$
$= (100630 \div 10)fr.\ 2c. = 10063fr.\ 2c.$

2. (1)

	q.	
4	1860	
12	465*d.*	
2,0	3,8 rem. 9*d.*	
	1 rem. 18*s.*	

Ans. £1. 18*s.* 9*d.*

£	*s.* *d.*
1	18 9
20	
38*s.*	
12	
465*d.*	
4	
1860*q.*	

	d.	
12	9763	
2,0	81,3 rem. 7*d.*	
	40 rem. 13*s.*	

Ans. £40. 13*s.* 7*d.*

£	*s.* *d.*
40	13 7
20	
813*s.*	
12	
9763*d.*	

	d.	
12	9763	
5	813 rem. 7*d.*	
	162 rem. 3*s.*	

Ans. 162 crowns, 3*s.* 7*d.*

crowns	*s.* *d.*
162	3 7
5	
813*s.*	
12	
9763*d.*	

(2)

	d.	
12	98763	
21 { 3	8230 rem. 3*d.*	
21 { 7	2743 rem. 1	
	391 rem. 6	

= 391 rem. (3 × 6 + 1)*s.* or 391 rem. 19*s.*

Ans. = 391 guins. 19*s.* 3*d.*

guins.	*s.* *d.*
391	19 3
21	
391	
782	
19	
8230*s.*	
12	
98763*d.*	

	d.	
3,0	9876,3	
	3292 rem. 3*d.*	

Ans. 3292 half-crowns, 3*d.*

half-crowns	*d.*
3292	3
30	
98763*d.*	

	half-pence.	
2	538621	
12	269310 rem. ½*d.*	
2,0	2244,2 rem. 6*d.*	
	1122 rem. 2*s.*	

Ans. £1122. 2*s.* 6½*d.*

£	*s.* *d.*
1122	2 6½
20	
22442*s.*	
12	
269310*d.*	
2	
538621 half-pence.	

3. $2934c. = (2934 \div 10)d. = 293d.\ 4c. = (293 \div 10)fr.\ 4c.$
$= 29fr.\ 3d.\ 4c.$
$29340c. = (29340 \div 10)d. = 2934d. = (2934 \div 10)fr. = 293fr.\ 4d.$
$29304c. = (29304 \div 10)d. = 2930d.\ 4c. = (2930 \div 10)fr.\ 4c.$
$= 293fr.\ 4c.$

4. $56003207c. = (56003207 \div 100)\ fr. = 560032fr.\ 7c.$
$= (560032 \div 20)\ Nap.\ 7c. = 28001\ Nap.\ 12fr.\ 7c.$

5.

£	£	£
25	25	25
8	40	60
200 half-crowns.	1000 sixpences.	1500 fourpences.

6.

fourpences
6300
4
3,0 | 2520,0*d.*
840 half-crowns.

fourpences
6300
4
6 | 25200*d.*
21 { 3 | 4200 sixpences
7 | 1400
200 half-guineas.

7.

seven-shilling pieces
351
14
1404
351
21 { 3 | 4914 sixpences
7 | 1638
234 half-guineas.

seven-shilling pieces
351
7
27 { 3 | 2457*s.*
9 | 819
91 moidores.

8.

half-guinea
2843
21
2843
5686
2 | 59703 sixpences
2,0 | 2985,1*s.* rem. 1 sixpence
1492 rem. 11*s.*

Ans. £1492. 11*s.* 6*d.*

9.

		c.
74 Napoleons	$= (74 \times 20)fr. = 1480fr.$	$= 148000$
42 fifty-franc pieces	$= (50 \times 42)fr. = 2100fr.$	$= 210000$
83 five-franc pieces	$= (83 \times 5)fr. = 415fr.$	$= 41500$
50 francs		$= 5000$
23 half-francs	$= (23 \times 50)\ c.$	$= 1150$
185 sous	$= (185 \times 5)\ c.$	$= 925$
		406575 *c.*

REDUCTION OF LENGTH.

Ex. X. Page 50.

(1)

ft. in.
31 4
12
376 in.

12 | 376
31 rem. 4 in.
Ans. 31 ft. 4 in.

yds.
5
3
15 ft.
12
180 in.

in.
12 | 180
3 | 15 ft.
5 yds.

yds. ft. in.
4 1 7
3
13 ft.
12
163 in.

in.
12 | 163
3 | 13 rem. 7 in.
4 rem. 1 ft.
Ans. 4 yds. 1 ft. 7 in.

(2)

yds. in.
17 11
3
51 ft.
12
623 in.

in.
12 | 623
3 | 51 rem. 11 in.
17 yds.
Ans. 17 yds. 11 in.

yds. ft. in.
4 $2\frac{1}{2}$
$=4$ 2 6
3
14 ft.
12
174 in.

in.
12 | 174
3 | 14 rem. 6 in., or $\frac{1}{2}$ ft.
4 rem. 2 ft.
Ans. 4 yds. $2\frac{1}{2}$ ft.

half yds.
17
18
136
17
306 in.

in.
18 { 3 | 306
6 | 102
17 half-yds.

(3)

po.	ft.	in.
14	1	2
5½		
70		
7		
77 yds.		
3		
232 ft.		
12		
2786 in.		

in.	
12	2786
3	232 rem. 2 in.
	77 rem. 1 ft.
	2
11	154 half-yds.
	14 po.

Ans. 14 po. 1 ft. 2 in.

m.
2
1760
3520 yds.
3
10560 ft.
12
126720 in.

in.	
12	126720
3	10560
176,0	352,0
	2

Ans. 2 m.

fur.	po.	yds.	in.
2	10	1	10
40			
90 p.			
5½			
451			
45			
496 yds.			
3			
1488 ft.			
12			
17866 in.			

in.	
12	17866
3	1488 rem. 10 in.
	496
	2
11	992 half-yds.
4,0	9,0 rem. 2 hf.-yds. = 1 yd.
	2 rem. 10 p.

Ans. 2 fur. 10 po. 1 yd. 10 in.

(4)

m.	fur.	po.	yds.	ft.	in.
43	3	39	5	2	11
8					
347 fur.					
40					
13919 po.					
5½					
69600					
6959½					
76559½ yds.					

76559 yds. 18 in.
36 since 36 in. = 1 yd.
459354
229677
18
35 since 2ft. 11 in. = 35 in.
2756177 in.

in.
36 { 3 | 2756177
12 | 918725 rem. 2 } rem. 17 in.
76560 rem. 5

2
11 | 153120 half-yds.
4,0 | 1392,0
8 | 348
43 rem. 4 fu.

Ans. 43 m. 4 fur. 17 in.

= 43 m. 3 fur. 40 po. 17 in. = 43 m. 3 fur. 39 po. $5\frac{1}{2}$ yds. 17 in.
= 43 m. 3 fur. 39 po. 5 yds. 35 in. = 43 m. 3 fur. 39 po. 5 yds. 2ft. 11 in.

m. yds. in.
184 $4\frac{1}{2}$ 9
1760
11040
1288
184
$4\frac{1}{2}$
$323844\frac{1}{2}$ yds.
= 323844 yds. 18 in.
36
1943064
971532
18
9
11658411 in.

in.
36 { 3 | 11658411
12 | 3886137 } 27 in. = (18 + 9) in. = $\frac{1}{2}$ yd. 9 in.

1760 { 10 | 323844 rem. 9
4 | 32384 rem. 4 yds.
4 | 8096
11 | 2024
184

Ans. 184 mi. $4\frac{1}{2}$ yds. 9 in.

(5) fur. chains
7 2
10
72 chains
100
7200 links

links
100 | 7200
10 | 72
7 rem. 2 chains

Ans. 7 fur. 2 chains.

ells qr.
56 1
5
281 qrs.
4
1124 nls.

nls.
4 | 1124
5 | 281
56 rem. 1 qr.
Ans. 56 ells 1 qr.

(6) ells 5 qrs. 4 nls. 2 in. 2
5
29 qrs.
4
118 nls.
2½
238
29½
267¼ in.

in.
267¼
4
9 | 1070 quarters of an in.
4 | 118 rem. 8 qrs. of an in., or 2 in.
5 | 29 rem. 2 nls.
5 rem. 4 qrs.
Ans. 5 ells, 4 qrs. 2 nls. 2 in.

mi. fur. po. yds. ft. in.
15 6 10 2 2 4
8
126 fur.
40
5050 po.
5½
25252
2525
27777 yds.
3
83333 ft.
12
1000000 in.

in.
12 | 1000000
3 | 83333 rem. 4 in.
27777 rem. 2 yds.
2
11 | 55554 half-yds.
4,0 | 505,0 rem. 4 half-yds., or 2 yds.
8 | 126 rem. 10 po.
15 rem. 6 fur.
Ans. 15 m. 6 fur. 10 po. 2 yds. 2 ft. 4 in.

(7) 50 kilom. = 500 hectom. = 5000 décam. = 50000 m., the converse is evident.
50 kilom. = 50000 m. = 500000 décim. = 5000000 centim.
3 kilom. 5 hectom. 7 m. = (3000 + 500 + 7) m.
= 3507 m. = 350700 centim.

(8) 2 kilom. 1 décim. 1 millim. = 2000 m. 1 décim. 1 millim.
= (2000000 + 100 + 1) millim.
= 2000101 millim.
570 décam. 1 m. 16 centim. = (5700000 + 1000 + 160) mil.
= 5701160 millim.

(9)

		in.
12	616	
3	51	rem. 4 in.
	17	

Ans. 17 yds. 4 in.

yds.	in.
17	4
36	
106	
51	
616 in.	

		in.	
18	3	5864	
	6	1954	rem. 2
		325	rem. 4

14 in.

Ans. 325 half-yds. 14 in.

half-yds.	in.
325	14
18	
2600	
325	
14	
5864 in.	

		in.	
18	3	79634	
	6	26544	rem. 2
11		4424	rem. 0
		402	rem. 2 hlf-yds., or 1 yd.

2 in.

Ans. 402 po. 1 yd. 2 in.

po.	yd.	in.
402	1	2
11		
4424	half-yds.	
18		
35394		
4424		
79634 in.		

(10)

		po.	
4,0	3012,6		
8	753	rem. 6 po.	
	94	rem. 1 fur.	

Ans. 94 m. 1 fur. 6 po.

m.	fur.	po.
94	1	6
8		
753	fur.	
40		
30126 po.		

	yds.	m.
1760	573911	326
	5280	
	4591	
	3520	
	10711	
	10560	
	151	yds.

Ans. 326 m. 151 yds.

m. yds. yds.
326 151 = (326 × 1760 + 151) yds.
= 573911

	in.
12	3005000
3	250416 rem. 8 in.
1760	83472 (47 m.
	7040
	13072
	12320
	752 yds.

Ans. 47 m. 752 yds. 8 in.

m.	yds.	in.
47	752	8
1760		
2820		
329		
47		
752		
83472 yds.		
36		
500840		
250416		
3005000 in.		

(11)

	nls.
4	4729
4	1182 rem. 1 nl.
	295 rem. 2 qrs.

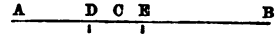
Ans. 295 yds. 2 qrs. 1 nl.

yds.	qrs.	nl.
295	2	1
4		
1182 qrs.		
4		
4729 nls.		

530278 décim. = (500000 + 30000 + 200 + 70 + 8) décim.
= 5 myriam. 3 kilom. 2 décam. 7 m. 8 décim.
(101010100) millim. = (100000000 + 1000000 + 10000 + 100) millim.
= 10 myriam. 1 kilom. 1 décam. 1 décim.

(12) 1000000000 centim. = (1000000000 ÷ 100000) kilom.
= 10000 kilom.
1000000000 centim. = (1000000000 ÷ 100) m.
= 10000000 m.

(13) *DE* length of village.



Then $AD = AB - BD$
= 649440 in. − 522720 in. = 126720 in.
And $DE = AE - AD$
= 2 m. 440 yds. − 126720 in. = 142560 in. − 126720 in.
= 15840 in. = 440 yds. = $\frac{1}{4}$ of a mile.

REDUCTION OF WEIGHT.

Ex. XI. Page 54.

(1)

oz.	dwts.	grs.
11	12	12
20		
232 dwts.		
24		
940		
464		
5580 grs.		

grs.

24 { 4 | 5580
6 | 1395
2,0 | 23,2 rem. 8 } grs. 12

11 rem. 12 dwts.

Ans. 11 oz. 12 dwts. 12 grs.

lbs.	oz.
9	5
12	
113 oz.	
20	
2260 dwts.	
24	
9040	
4520	
54240 grs.	

grs.

24 { 4 | 54240
6 | 13560
2,0 | 226,0
12 | 113

9 rem. 5 oz.

Ans. 9 lbs. 5 oz.

(2)

cwt.	lbs.	oz.
8	27	1
112		
896		
27		
923 lbs.		
16		
5539		
923		
14769 oz.		
16		
88614		
14769		
236304 drs.		

drs.

16 { 4 | 236304
4 | 59076
16 { 4 | 14769
4 | 3692 rem. 1 oz.
112 | 923 (8 cwt.
896
27 lbs.

Ans. 8 cwt. 27 lbs. 1 oz.

cwt. lbs.
3 22
112
336
22
358 lbs.
16
2148
358
5728 oz.
16
34368
5728
91648 drs.

drs.
16 { 4 | 91648
4 | 22912
16 { 4 | 5728
4 | 1432
112 | 358 (3 cwt.
336
22 lbs.

Ans. 3 cwt. 22 lbs.

(3)

tons cwt. qr. lbs.
34 7 1 13
20
687 cwt.
4
2749 qrs.
28
21992
5498
13
76985 lbs.
16
461910
76985
1231760

oz.
16 { 4 | 1231760
4 | 307940
28 { 4 | 76985
7 | 19246 rem. 1 } 13 lbs.
4 | 2749 rem. 3 }
2,0 | 68,7 rem. 1 qr.
34 rem. 7 cwt.

Ans. 34 tons 7 cwt. 1 qr. 13 lbs.

cwt. qr. lbs.
9 1 18
4
37 qrs.
28
296
74
18
1054 lbs.
16
6324
1054
16864 oz.

oz.
16 { 4 | 16864
4 | 4216
28 { 4 | 1054
7 | 263 rem. 2 } 18 lbs.
4 | 37 rem. 4 }
9 rem. 1 qr.

Ans. 9 cwt. 1 qr. 18 lbs.

(4)

oz. dwts. grs.
10 15 13
20
215 dwts.
24
860
430
13
5173 grs.

grs.
24 { 4 | 5173
{ 6 | 1293 rem. 1
2,0 | 21,5 rem. 3 } 13 grs.
10 rem. 15 dwts.

Ans. 10 oz. 15 dwts. 13 grs.

lbs. oz.
9 9
12
117 oz.
20
2340 dwts.
24
9360
4680
56160

grs.
24 { 4 | 56160
{ 6 | 14040
2,0 | 234,0
12 | 117
9 rem. 9 oz.

Ans. 9 lbs. 9 oz.

(5)

lbs. ℈
2 2
12
24 oz.
8
192 drs.
3
578 sc.
20
11560 grs.

grs.
2,0 | 11560
3 | 578
8 | 192 rem. 2 sc.
12 | 24
2

Ans. 2 lbs. 2 ℈.

lbs. ℥
7 7
12
84 oz.
8
679 drs.
3
2037 scr.
20
40740 grs.

grs.
2,0 | 40740
3 | 2037
8 | 679
12 | 84 rem. 7 drs.
7

Ans. 7 lbs. 7 ℥.

lbs.	℥	ʒ	℈
27	7	2	1
12			
331 oz.			
8			
2650 drs.			
3			
7951 sc.			
20			
159020 grs.			

grs.	
2,0	15902,0
3.	7951
8	2650 rem. 1 sc.
12	331 rem. 2 drs.
	27 rem. 7 oz.

Ans. 27 lbs. 7 ℥. 2 ʒ. 1 ℈.

(6) 2 kilog. 67 gr. = (20000 + 670) décig. = 20670 décig.
661 hectog. 1 décag. = (661000 + 100) décig. = 661100 décig.

(7) 1 quint. 67 kilog. = 167 kilog. = 1670000 décig.
500 décag. = 50000 décig.
1 kilog. 518 gr. = (10000 + 5180) décig. = 15180 décig.

(8)

		oz.	
16	4	11000022	
	4	2750005 rem. 2	6 oz.
28	4	687501 rem. 1	
	7	171875 rem. 1	17 lbs.
	4	24553 rem. 4	
	2,0	613,8 rem. 1 qr.	
		306 rem. 18 cwt.	

Ans. 306 tons, 18 cwt. 1 qr. 17 lbs. 6 oz.

tons	cwt.	qr.	lbs.	oz.
306	18	1	17	6
20				
6138 cwt.				
4				
24553 qr.				
28				
196424				
49106				
17				
687501 lbs.				
16				
4125012				
687501				
11000022 oz.				

lbs.
7
7000
24 { 4 | 49000 grs.
6 | 12250
2,0 | 204,1 rem. 4 } 16 grs.
12 | 102 rem. 1 dwt.
8 rem. 6 oz.

Ans. 8 lbs. 6 oz. 1 dwt. 16 grs.

lbs. oz. dts. gr.
8 6 1 16
12
102 oz.
20
2041 dwts.
24
8164
4082
16
7,000 | 49,000 grs.
7 lbs. avoird.

(9)

grs.
2,0 | 15902,2
3 | 7951 rem. 2 grs.
8 | 2650 rem. 1 sc.
12 | 331 rem. 2 dr.
27 rem. 7 oz.

Ans. 27 lbs. 7 oz. 2 dr. 1 sc. 2 grs.

(25040037) décig. = (25040000 + 30 + 7) décig.
= 2504 kilog. 3 grs. 7 décig.

décig.
(10) 1st cask weighs 84 kilog. 35 décag. = 843500
2nd..... 93 kilog. 3 décag. = 930300
3rd..... 75643 gr. or 756430
∴ the whole weight = 2530230 décig.

MEASURES OF SURFACE.—CHAP. XII. Page 58.

1. (1)

sq. yds. sq. ft. sq. in.
5 7 56
9
52 sq. ft.
144
208
208
52
56
7544 sq. in.

sq. in.
144 { 12 | 7544
12 | 628 rem. 8 } 56 sq. in.
9 | 52 rem. 4
5 rem. 7 sq. ft.

Ans. 5 sq. yds. 7 sq. ft. 56 sq. in.

sq. po.
7058
$30\frac{1}{4}$
211740
$1764\frac{2}{4}$
$213504\frac{2}{4}$ sq. yds.

sq. yds. sq. ft. sq. in.
$=213504 \quad 4 \quad 72$
9
1921540 sq. ft.
144
7686160
7686160
1921540
72
276701832 sq. in.

sq. in.
144 { 12 | 276701832
12 | 23058486
9 | 1921540 rem. 6 } 72 sq. in.
213504 rem. 4 sq. ft.
4
121 { 11 | 854016 qrs. of sq. yds.
11 | 77637 rem. 9
7057 rem. 10 } 119 qrs. of sq. yds. $=29\frac{3}{4}$ sq. yds.

Ans. $=7057$ sq. po. $29\frac{3}{4}$ sq. yds. 4 sq. ft. 72 sq. in.

{$\frac{3}{4}$ sq. yd. $=(3\times9\div4)$ sq. ft. $=6\frac{3}{4}$ sq. ft.
$\frac{3}{4}$ sq. ft. $=(3\times144\div4)$ sq. in. $=108$ sq. in.}
$=7057$ sq. po. 29 sq. yds. 10 sq. ft. 180 sq. in.
$=7057$ sq. po. 30 sq. yds. 1 sq. ft. 180 sq. in.
$=7057$ sq. po. 30 sq. yds. 2 sq. ft. 36 sq. in.
{$\frac{1}{4}$ sq. yd. $=(9\div4)$ sq. ft. $=2\frac{1}{4}$ sq. ft.
$\frac{1}{4}$ sq. ft. $=(144\div4)$ sq. in. $=36$ sq. in.}
$=7057$ sq. po. $30\frac{1}{4}$ sq. yds. $=7057$ sq. po. 1 sq. po.
$=7058$ sq. po.

(2)
ac. ro. po.
586 1 27
4
2345 ro.
40
93827 po.

po.
4,0 | 9382,7
4 | 2345 rem. 27 po.
586 rem. 1 ro.
Ans. 586 ac. 1 ro. 27 po.

ac.	ro.	po.
37	3	12
4		
151 ro,		
40		
6052 po.		
$30\frac{1}{4}$		
181560		
1513		
183073 sq. yds.		

sq. yds.
183073
4

121 | 11 | 732292 qrs. of sq. yds.
11 | 66572
4,0 | 605,2 sq. po.
4 | 151 rem. 12 po.
37 rem. 3 ro.

Ans. 37 ac. 3 ro. 12 po.

(3)

ac.	po.
236	15
4	
944 ro.	
40	
37775 po.	
$30\frac{1}{4}$	
1133250	
$9443\frac{3}{4}$	
$1142693\frac{3}{4}$ sq. yds.	

sq. yds. sq. ft. sq. in.
$=1142693$ 6 108 See Ex. (1).
9
10284243 sq. ft.
144
41136972
41136972
10284243
108
1480931100

sq. in.

144 | 12 | 1480931100
12 | 123410925
9 | 10284243 rem. 9 } 108 sq. in.
1142693 rem. 6 sq. ft.
4

121 | 11 | 4570772 qrs. of sq. yds.
11 | 415524 rem. 8 } 118 qrs. of sq. yds. $=29\frac{1}{2}$ sq. yds.
4,0 | 3777,4 rem. 10
4 | 944 rem 14 po.
236

Ans. 236 ac. 14 po. $29\frac{1}{2}$ sq. yds. 6 sq. ft. 108 sq. in.

{$\frac{2}{4}$ sq. yds. = (18 ÷ 4) sq. ft. = $4\frac{2}{4}$ sq. ft.
$\frac{2}{4}$ sq. ft. = (2 × 144 ÷ 4) sq. in. = 72 sq. in.}
= 236 ac. 14 po. 29 sq. yds. 4 sq. ft. 72 sq. in. 6 sq. ft. 108 sq. in.
= 236 ac. 14 po. 29 sq. yds. 10 sq. ft. 180 sq. in.
= 236 ac. 14 po. 30 sq. yds. 1 sq. ft. 180 sq. in.
= 236 ac. 14 po. 30 sq. yds. 2 sq. ft. 36 sq. in.
= 236 ac. 14 po. $30\frac{1}{4}$ sq. yds. See Ex. (1).
= 236 ac. 15 po.

ac. sq. yds. sq. in.
10 27 140
4
40 ro.
40
1600 po.
$30\frac{1}{4}$
48000
400
27
48427 sq. yds.
9
435843 sq. ft.
144
1743372
1743372
435843
140
62761532 sq. in.

144 { 12 | 62761532 sq. in.
12 | 5230127 rem. 8 } 140 sq. in.
9 | 435843 rem. 11 }
48427
4

121 { 11 | 193708 qrs. of sq. yds.
11 | 17609 rem. 9 } 108 qrs. of sq. yds. = 27 sq. yds.
4,0 | 160,0 rem. 9 }
4 | 40
10

Ans. 10 ac. 27 sq. yds. 140 sq. in.

(4) 144 { 12 | sq. in. 40000 ; 12 | 3333 rem. 4 } ; 9 | 277 rem. 9 } 112 sq. in.

30 rem. 7 sq. ft.

Ans. 30 sq. yds. 7 sq. ft. 112 sq. in.

sq. yds. sq. ft. sq. in.
30 7 112
9
277 sq. ft.
144
1108
1108
277
112
40000 sq. in.

4,0 | po. 2000,0
4 | 500 ro.
125 ac.

ac.
125
4
500 ro.
40
20000 po.

(5) sq. mi.
49
640
1960
294
31360 ac.

4,0 | po. 97609,1
4 | 24402 rem. 11 po.
6100 rem. 2 ro.

64,0) ac. 3136,0 (sq. mi. 49
256
576
576

640) ac. 6100 (sq. mi. 9
5760
340 ac.

Ans. 9 sq. mi. 340 ac. 2 ro. 11 po.

sq. mi. ac. ro. po.
9 340 2 11
640
360
54
340
6100 ac.
4
24402 ro.
40
976091 po.

(6)
ac.	ro.
15	3
4	
63 ro.	
25000	
315000	
126	
1575000 links.	

	1000	links. 1575000
25000	5	1575
	5	315
	4	63 ro.
		15 rem. 3 ro.

Ans. 15 ac. 3 ro.

4 hectar. 3 ares = (400 + 3) ares = 403 ares
= 40300 centiar.
40300 centiar. = (40000 + 300) centiar. = 4 hectar. 3 ares.

(7) 128 hectar. 60 ares = (12800 + 60) ares = (12860) ares
= 128600 deciar.
128600 deciar. = (128000 + 600) deciar. = 128 hectar. 60 ares.
7000 ares, 25 centiar. = (700000 + 25) centiar. = 700025 centiar.
700025 centiar. = (700000 + 20 + 5) centiar.
= 7000 ares, 2 deciar. 5 centiar. = 7000 ares, 25 centiar.

(8) 23 hectar. 9 ares, 36 centiar. = (230000 + 900 + 36) centiar.
= 230936 centiar.
3 hectar. 15 centiar. = (30000 + 15) centiar. = 30015 centiar.
2700356 centiar. = (2700000 + 300 + 50 + 6) centiar.
= 270 hectar. 3 ares, 5 deciar. 6 centiar.

2.
sq. miles	
50535	in England
8125	in Wales
29167	in Scotland
87827	sq. miles in all
640	
3513080	
526962	
56209280	sq. acres.

MEASURES OF SOLIDITY.—Ex. XIII. Page 61.

(1) 9 cub. ft. = (9 × 1728) cub. in. = 15552 cub. in.
17 cub. ft. 17 cub. in. = (17 × 1728 + 17) cub. in.
= (29376 + 17) cub. in. = 29393 cub. in.

cub. yds.
6
27
162 cub. ft.
1728
1296
324
1134
162
279936 cub. in.

cub. in.
1728 | 279936
12 | 23328
12 | 1944
27 | 162 cub. ft.
3 | 54
9
6 cub. yds.

(2) cub. yds. 18, cub. ft. 16, cub. in. 1260
27
142
36
502 cub. ft.
1728
4010
1004
3514
502
1260
868716 cub. in.

cub. in. cub. ft.
1728) 868716 (502
8640
4716
3456
1260 cub. in.

cub. ft.
27 | 3 | 502
9 | 167 rem. 1
18 rem. 5
16 cub. ft.

Ans. 18 cub. yds. 16 cub. ft. 1260 cub. in.

cub. yds. 160, cub ft. 12, cub. in. 1208
27
1132
320
4332 cub. ft.
1728
34656
8664
30324
4332
1208
7486904 cub. in.

cub. in. cub. ft.
1728) 7486904 (4332
6912
5749
5184
5650
5184
4664
3456
1208 cub. in.

cub. ft.
27 | 3 | 4332
9 | 1444
160 rem. 4
12 cub. ft.

Ans. 160 cub. yds. 12 cub. ft. 1208 cub. in.

(3) 3 décast. 3 décist. = (30 + 3) décist. = 303 décist.
38 stères = 380 décist.; 348 décast. = 34800 décist.

(4) 853 décist. = (800 + 50 + 3) décist.
= 8 décast. 5 stères, 3 décist.
803 décist. = (800 + 3) décist. = 8 décast. 3 décist.
830 décist. = (800 + 30) décist. = 8 décast. 3 stères,
the converse is evident.

(5)
cub. in. cub. ft.
1728) 61736 (35
5184
9896
8640
1256 cub. in.

61736 cub. in. = 35 cub. ft. 1256 cub. in.
= 1 cub. yd. 8 cub. ft. 1256 cub. in.

cub. in. cub. ft.
1728) 289630413 (167610
1728
11683
10368
13150
12096
10544
10368
1761
1728
333 cub. in.

cub. ft.
27 { 3 | 167610
9 | 55870
6207 rem. 7 } 21 cb. ft.

Ans. = 167610 cub. ft. 333 cub. in.
= 6207 cub. yds. 21 cub. ft. 333 cub. in.
the converse is evident.

MEASURES OF CAPACITY.—Ex. XIV. Page 63.

(1) 563 gals. = (563 × 4) or 2252 qts. = (2252 × 2) or 4504 pts.
3 pipes = (3 × 2) or 6 hhds. = (6 × 63) or 378 gals.
= (378 × 4) or 1512 qts.
= (1512 × 2) or 3024 pts.

(2) 1½ butts of beer = (1½ × 2) or 3 hhds. = (3 × 54) or 162 gals.
= (162 × 4) or 648 qts.
= (648 × 2) or 1296 pts.

gills
4 | 405763
2 | 101440 rem. 3 gills
4 | 50720
12680

Ans. 12680 gals. 3 gills.

(3)

qrs.	bus.
6	6
8	
54 bus.	
4	
216 pks.	
2	
432 gals.	

loads	pks.
3	3
5	
15 qrs.	
8	
120 bus.	
4	
483 pks.	
2	
966 gals.	

(4)

qts.
4 | 465871
2 | 116467 rem. 3 qts.
4 | 58233 rem. 1 gal.
8 | 14558 rem. 1 pk.
5 | 1819 rem. 6 bus.
363 rem. 4 qrs.

Ans. 363 lds. 4 qrs. 6 bus. 1 pk. 1 gal. 3 qts.

gals.
2 | 217895
4 | 108947 rem. 1 gal.
8 | 27236 rem. 3 pks.
3404 rem. 4 bus.

Ans. 3404 qrs. 4 bus. 3 pks. 1 gal.

(5) 8 lit. 35 centil. = (800 + 35) centil. = 835 centil.
7 hectol. 7 décil. = (70000 + 70) centil. = 70070 centil.

(6) 50603 centil. = (50000 + 600 + 3) centil.
= 5 hectol. 6 lit. 3 centil.
1185060 lit. = (1185000 + 60) lit. = 11850 hectol. 6 décal.

MEASURES OF NUMBER AND TIME.

Ex. XV. Page 64.

1. (1) 2 reams = (2 × 20) or 40 quires = (40 × 24) or 960 sheets,
584 quires = 584 ÷ 20 reams = 29 reams, 4 quires.

(2)

hrs.	min.	sec.
17	56	38
60		
1076 min.		
60		
64598 sec.		

com. yrs.	wks.	hrs.
2	3	15
365		
(730 + 21) or 751 days		
		24
		3019
		1502
		18039 hrs.
		60
		1082340 min.
		60
		64940400 sec.

(3)

		sec.
6,0		817940,0
6,0		13632,3 rem. 20 sec.
24	3	2272 rem. 3 min.
	8	757 rem. 1 } 16 hrs.
		94 rem. 5 }

Ans. 94 yrs. 16 hrs. 3 min. 20 sec.

2.

	days.
In January there remain	22
In February there are....	29
In March	15
	66
	24
	264
	132
	1584 hrs.

No. of days from March 1 to Dec. 31
= 30 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 30 + 30 = 304;
∴ No. of hours = 304 × 24 = 7296.

COMPOUND ADDITION.—Ex. XVI. Page 66.

1. (1) £9. 9*s*. 5*d*.
(2) £103. 14*s*. 3*d*.
(3) £424. 6*s*. 11*d*.
(4) £1089. 5*s*. 5½*d*.
(5) £281. 16*s*. 9¾*d*.
(6) £13771. 6*s*. 4½*d*.
(7) 2 mi. 2 fur. 99 yds. 35 in.
(8) 344 mi. 3 fur. 15 po. 4½ yds.
(9) 117 tons, 15 cwt. 2 qrs. 2 lbs.
(10) 118 lbs. 10 oz. 18 dwt. 21 grs.
(11) 63 sq. yds. 5 ft. 86 in.
(12) 312 ac. 1 ro. 33 po. 23¼ yds.
(13) 570 qrs. 4 bus. 2 qts.
(14) 2630 cub. yds. 21 ft. 573 in.
(15) 119 wks. 6 dys. 14 hrs. 12′. 35″.

2.

	£	*s*.	*d*.
Grocer's bill =	18	9	6
Linendraper's =	31	10	0
Shoemaker's =	5	10	6¾
Blacksmith's =	1	11	6
Wine-merchant's =	56	15	3
Brewer's =	8	8	0
	122	4	9¾

3.

	lbs.	oz.	dwts.	grs.
1st nugget weighed	0	2	13	9
2nd.....	0	0	18	17
3rd.....	0	11	0	21
4th.....	2	0	15	18
5th.....	0	4	15	18
All the nuggets weighed	3	8	4	11

4.

	mi.	fur.	po.
Distance on Monday =	27	3	2
..... Tuesday =	19	7	30
..... Wednesday =	21	0	17
..... Thursday =	41	0	7
..... Friday =	41	0	9
..... Saturday =	19	7	30
Distance travelled in the week =	170	3	15

5.

	ac.	ro.	po.	yds.
Wheat =	23	2	19	20
Barley =	12	3	25	$15\frac{1}{2}$
Oats =	10	3	36	23
Peas =	25	2	0	0
Fallow =	18	2	2	0
Grass =	30	2	0	0
Size of farm =	122	0	3	$28\frac{1}{2}$

6.

	£	s.	d.
1st parcel contained	206	0	10
2nd	58	10	$4\frac{1}{2}$
3rd	14	4	2
4th	71	2	$4\frac{1}{4}$
5th	9	17	6
∴ savings amount to	359	15	$3\frac{1}{4}$

Ex. XVII. Page 69.

1.

	c.
594 *fr.* 30 *c.* =	59430
1901 *fr.* 7 *c.* =	190107
4000 *fr.* =	400000
131 *fr.* 1 *d.* 7 *c.* =	13117
253 *fr.* 4 *c.* =	25304
	687958 = 6879 *fr.* 58 *c.*

	c.
403 *fr.* 26 *c.* =	40326
30 *fr.* 5 *c.* =	3005
119 *fr.* 75 *c.* =	11975
673 *fr.* 54 *c.* =	67354
10 *fr.* =	1000
1025 *fr.* 3 *d.* =	102530
	226190 c. = 2261 *fr.* 90 *c.*

	centil.
61 hectol. 2 lit. 80 centil. =	610280
686 hectol. 4 centil. =	6860004
87 décal. 5 décil. =	87050
782 hectol. 8 lit. =	7820800
	15378134 centil.

= 1537 hectol. 8 décal. 1 lit. 3 décil. 4 centil.

millim.
28 myriam. 7 décam. 5 centim. = 280070050
1 kilom. 1 millim. = 1000001
500 mètres = 500000
5 myriam. 51 décim. = 50005100
300 hectom. 54 centim. = 30000540
361575691 millim.

= 36 myriam. 1 kilom. 5 hectom. 7 décam. 5 m. 6 décim. 9 centim. 1 millim.

centiar.
576 hectar. 12 ares = 5761200
1000 decar. = 1000000
26 hectar. 44 centiar. = 260044
40000 ares = 4000000
9 hectar. 6 decar. 60 deciar. = 96600
11117844 centiar.

1111 hectar. 7 decar. 8 ares 4 deciar. 4 centiar.

décig.
87 kilog. 50 gram. = 870500
8 kilog. 7 décig. = 80007
250 hectog. = 250000
4 kilog. 500 gram. = 45000
1245507 décig.

= 124 kilog. 5 hectog. 5 décag. 7 décig.

2. Lot 1 contained 34 st. 2 décist. = 342
... 2 ..... 29 st. 4 décist. = 294
... 3 ..... 85 st. 3 décist. = 853
... 4 ..... 54 st. = 540
∴ he bought 2029 st. = 202 st. 9 décist.

3. centiar.
1st estate = 424 hectar. 17 ares = 4241700
2nd ..... = 1000 hectar. 82 ares 9 centiar. = 10008209
3rd ..... = 3916 hectar. 57 ares 84 centiar. = 39165784
4th ..... = 594 hectar. 8 centiar. = 5940008
∴ land under management = 59355701 c.
= 5935 hectar. 5 decar. 7 ares 1 centiar.

4. *fr.* *fr.* *fr.* *c.*
Stocking contained 480 and 30 = 510 = 51000
Bag ..... 500 and 375 = 875 = 87500
fr. *c.* *c.* *c.*
Drawer ..... 56 and 650 = 5600 and 650 = 6250
144750 *c.*

= 1447 *fr.* 50 *c.*

COMPOUND SUBTRACTION.—Ex. XVIII. Page 71.

1. (1) £14. 1*s*. 8*d*. (2) £2. 0*s*. 11*d*. (3) £9. 18*s*. 11*d*.
(4) £47. 13*s*. 1½*d*. (5) 19*s*. 11½*d*. (6) £7. 18*s*. 10¾*d*.
(7) £88. 3*s*. 4¼*d*. (8) £875. 0*s*. 10¾*d*.
(9) £162. 11*s*. 11½*d*. (10) 8 mi. 5 fur.
(11) 3 mi. 5 fur. 10 po. 4 yds. (12) 1 cwt. 3 qrs. 25 lbs.
(13) 3 tons 16 cwt. 3 qrs. 6 lbs.
(14) 9 sq. yds. 8 sq. ft. 96 sq. in.
(15) 1 ac. 3 ro. 20 po. 4¾ yds. 6 ft.
(16) 65 cub. yds. 2 cub. ft. 1682 cub. in.
(17) 1 ld. 5 bus. 2 pks.
(18) 6 yrs. 47 wks. 6 dys. 3 hrs.

2. Amount of bills = £14. 10*s*. 5*d*. + £5. 7*s*. 10½*d*.
+ £21. 19*s*. 6¾*d*. + £104. 6*s*. 9½*d*. = £146. 4*s*. 7½*d*.
∴ servant ought to return £150 − £146. 4*s*. 7½*d*. = £3. 15*s*. 4½*d*.

3. *A* has in his pocket £5. 5*s*., *B* has in his pocket £4. 5*s*. 10½*d*., *C* has in his pocket £9. 15*s*.; *B* pays *A* £3. 10*s*. 9¾*d*., *C* pays *B* £4. 14*s*. 6*d*., *C* pays *A* £1. 1*s*.
∴ *A* has £5. 5*s*. + £3. 10*s*. 9¾*d*. + £1. 1*s*. = £9. 16*s*. 9¾*d*.,
B has £4. 5*s*. 10½*d*. + £4. 14*s*. 6*d*. − £3. 10*s*. 9¾*d*.
= £9. 0*s*. 4½*d*. − £3. 10*s*. 9¾*d*. = £5. 9*s*. 6¾*d*.,
C has £9. 15*s*. − £5. 15*s*. 6*d*. = £3. 19*s*. 6*d*.

4. Weight of spoons = 26 lbs. 10 oz. 13 dwts.
+ 38 lbs. 10 oz. 11 dwts. 19 grs. = 65 lbs. 9 oz. 4 dwts. 19 grs.
∴ weight of salver = 84 lbs. 9 oz. 9 dwts. 10 grs.
− 65 lbs. 9 oz. 4 dwts. 19 grs. = 19 lbs. 4 dwts. 15 grs.

5. Woodland = 600 ac. − (206 ac. 2 ro. 20 po. + 87 ac. 1 ro. 15 po.)
= 600 ac. − 293 ac. 3 ro. 35 po.
= 306 ac. 5 po.

Ex. XIX. Page 74.

1. (1)

fr.	*c.*	*c.*
5	15	= 515
3	2	= 302
		213 *c.* = 2 *fr.* 13 *c.*

(2)
fr.	*c.*	*c.*
48	8	= 4808
36	27	= 3627
		1181 *c.* = 11 *fr.* 81 *c.*

(3)
fr.	*c.*	*c.*
3	5	= 305
1	75	= 175
		130 *c.* = 1 *fr.* 30 *c.*

(4)
kilog.	déca.	déci.	décig.	
763	5			= 7630500
604		54		= 6040054
				1590446 décig.
				= 159 kilog. 4 décag. 4 gr. 6 décig.

(5)
hectol.	lit.	lit.	
178			= 17800
139	75		= 13975
			3825 lit. = 38 hectol. 25 lit.

(6)
kilom.	mèt.	millim.	millim.	
475	17			= 475017000
2530	20	=	2530020	
			472486980	
			= 472 kil. 486 mèt. 980 millim.	

2.

		c.
6800 *fr.*		= 680000
3465 *fr.*	35 *c.*	= 346535
7444 *fr.*		= 744400

bills amount to 1770935 *c.*,

he ought to have in his desk (7485125 − 1770935) *c.*
= 5714190 *c.*,

he has in his desk 5714635 *c.*,

he has paid 445 *c.* or 4 *fr.* 45 *c.* two little.

3. He sells to the two customers (3750 + 3305) centim. or 7055 centim.,

he has left (8500 − 7055) or 1445 centim. = 14 m. 45 centim.,

of the third order he cannot execute (4517 − 1445) or 3072 centim. = 30 m. 72 centim.

4.

	st. décist.	décist.
348	2	= 3482
268	3	= 2683
		799 décist.

he buys (1250 − 799) or 451 décist. or 45 st. 1 décist. too little.

5. Arable land = (22500 − 9560) ares = 12940 ares;
∴ arable land exceeds pasture by (12940 − 9560) ares
= 3380 ares
= 33 hectar. 80 ares.

COMPOUND MULTIPLICATION.—Ex. XX. Page 77.

1. (1)

£	s.	d.
2	10	4
		4
10	1	4

£	s.	d.
2	10	4
		7
17	12	4

£	s.	d.
2	10	4
		8
20	2	8

£	s.	d.
2	10	4
		9
22	13	0

£	s.	d.
2	10	4
		11
27	13	8

(2)

£	s.	d.
12	18	9
		3
38	16	3

£	s.	d.
12	18	9
		5
64	13	9

£	s.	d.
12	18	9
		6
77	12	6

£	s.	d.
12	18	9
		10
129	7	6

£	s.	d.
12	18	9
		12
155	5	0

(3)

£	s.	d.	
9	4	7	¼
		4	
36	18	5	

£	s.	d.	
9	4	7	¼
		5	
46	3	0	¼

£	s.	d.	
9	4	7	¼
		9	
83	1	5	¼

£	s.	d.	
9	4	7	¼
		11	
101	10	7	¾

£	s.	d.	
9	4	7	¼
		12	
110	15	3	

(4)

£	s.	d.
24	14	$11\frac{3}{4}$
		2
49	9	$11\frac{1}{2}$

£	s.	d.
24	14	$11\frac{3}{4}$
		6
148	9	$10\frac{1}{2}$

£	s.	d.
24	14	$11\frac{3}{4}$
		7
173	4	$10\frac{1}{4}$

£	s.	d.
24	14	$11\frac{3}{4}$
		10
247	9	$9\frac{1}{2}$

£	s.	d.
24	14	$11\frac{3}{4}$
		11
272	4	$9\frac{1}{4}$

(5)

£	s.	d.
47	18	$10\frac{1}{2}$
		3
143	16	$7\frac{1}{2}$

£	s.	d.
47	18	$10\frac{1}{2}$
		5
239	14	$4\frac{1}{2}$

£	s.	d.
47	18	$10\frac{1}{2}$
		7
335	12	$1\frac{1}{2}$

£	s.	d.
47	18	$10\frac{1}{2}$
		10
479	8	9

£	s.	d.	
47	18	$10\frac{1}{2}$	
		3	
143	16	$7\frac{1}{2}$	for 3
		4	
575	6	6	for 3×4 or 12
47	18	$10\frac{1}{2}$	for 1
623	5	$4\frac{1}{2}$	for 13

(6)

£	s.	d.
22	15	$0\frac{1}{2}$
		9
204	15	$4\frac{1}{2}$

£	s.	d.	
22	15	$0\frac{1}{2}$	
		2	
45	10	1	for 2
		7	
318	10	7	for 2×7 or 14

£	s.	d.	
22	15	$0\frac{1}{2}$	
		4	
91	0	2	for 4
		4	
364	0	8	for 4×4 or 16

£	s.	d.	
22	15	$0\frac{1}{2}$	
		4	
91	0	2	for 4
		5	
455	0	10	for 4×5 or 20

£	s.	d.	
22	15	0¼	
		4	
91	0	2	for 4
		6	
546	1	0	for 4 × 6 or 24

(7)

£	s.	d.	
186	0	9¾	
		8	
1488	6	6	

£	s.	d.	
186	0	9¾	
		2	
372	1	7½	for 2
		9	
3348	14	7½	for 2 × 9 or 18

£	s.	d.	
186	0	9¾	
		4	
744	3	3	for 4
		7	
5209	2	9	for 4 × 7 or 28

£	s.	d.	
186	0	9¾	
		7	
1302	5	8¼	for 7
		7	
9115	19	9¾	for 7 × 7 or 49

£	s.	d.	
186	0	9¾	
		7	
1302	5	8¼	for 7
		8	
10418	5	6	for 7 × 8 or 56

(8)

£	s.	d.	
583	15	3¼	
		5	
2918	16	4¼	for 5
		9	
26269	7	2¼	for 5 × 9 or 45

£	s.	d.	
583	15	$3\frac{1}{4}$	
		7	
4086	6	$10\frac{3}{4}$	for 7
		11	
44949	15	$10\frac{1}{4}$	for 7 × 11 or 77

£	s.	d.	
583	15	$3\frac{1}{4}$	
		7	
4086	6	$10\frac{3}{4}$	for 7
		12	
49036	2	9	for 7 × 12 or 84

£	s.	d.	
583	15	$3\frac{1}{4}$	
		8	
4670	2	2	for 8
		12	
56041	6	0	for 8 × 12 or 96
583	15	$3\frac{1}{4}$	subtract for 1
55457	10	$8\frac{3}{4}$	for 95

£	s.	d.	
583	15	$3\frac{1}{4}$	
		10	
5837	12	$8\frac{1}{2}$	for 10
		10	
58376	7	1	for 10 × 10 or 100
52538	14	$4\frac{1}{2}$	for 10 × 9 or 90
4086	6	$10\frac{3}{4}$	for 7
115001	8	$4\frac{1}{4}$	for 197

(9)

£	s.	d.	
3041	7	$5\frac{3}{4}$	
		10	
30413	14	$9\frac{1}{2}$	for 10
		10	
304137	7	11	for 10 × 10 or 100
		3	
912412	3	9	for 100 × 3 or 300
152068	13	$11\frac{1}{2}$	for 10 × 5 or 50
3041	7	$5\frac{3}{4}$	for 1
1067522	5	$2\frac{1}{4}$	for 351

£	s.	d.	
3041	7	$5\frac{3}{4}$	
		10	
30413	14	$9\frac{1}{2}$	for 10
		10	
304137	7	11	for 10 × 10 or 100
152068	13	$11\frac{1}{2}$	for 10 × 5 or 50
15206	17	$4\frac{3}{4}$	for 5
471412	19	$3\frac{1}{4}$	for 155

£	s.	d.	
3041	7	$5\frac{3}{4}$	
		10	
30413	14	$9\frac{1}{2}$	for 10
		10	
304137	7	11	for 10 × 10 or 100
		4	
1216549	11	8	for 100 × 4 or 400
212896	3	$6\frac{1}{2}$	for 10 × 7 or 70
12165	9	11	for 4
1441611	5	$1\frac{1}{2}$	for 474

£	s.	d.	
3041	7	$5\frac{3}{4}$	
		10	
30413	14	$9\frac{1}{2}$	for 10
		10	
304137	7	11	for 10 × 10 or 100
		7	
2128961	15	5	for 100 × 7 or 700
60827	9	7	for 10 × 2 or 20
27372	7	$3\frac{3}{4}$	for 9
2217161	12	$3\frac{3}{4}$	for 729

(10)

£	s.	d.	
11009	0	$0\frac{3}{4}$	
		10	
110090	0	$7\frac{1}{2}$	for 10
		10	
1100900	6	3	for 10 × 10 or 100
		2	
2201800	12	6	for 100 × 2 or 200
550450	3	$1\frac{1}{2}$	for 10 × 5 or 50
77063	0	$5\frac{1}{4}$	for 7
2829313	16	$0\frac{3}{4}$	for 257

£	s.	d.	
11009	0	$0\frac{3}{4}$	
		10	
110090	0	$7\frac{1}{2}$	for 10
		10	
1100900	6	3	for 10 × 10 or 100
		5	
5504501	11	3	for 100 × 5 or 500
33027	0	$2\frac{1}{4}$	for 3
5537528	11	$5\frac{1}{4}$	for 503

£	s.	d.	
11009	0	$0\frac{3}{4}$	
		10	
110090	0	$7\frac{1}{2}$	for 10
		10	
1100900	6	3	for 10 × 10 or 100
		10	
11009003	2	6	for 100 × 10 or 1000
		4	
44036012	10	0	for 1000 × 4 or 4000
8807202	10	0	for 100 × 8 or 800
990810	5	$7\frac{1}{2}$	for 10 × 9 or 90
66054	0	$4\frac{1}{2}$	for 6
53900079	6	0	for 4896

£	s.	d.	
11009	0	$0\frac{3}{4}$	
		10	
110090	0	$7\frac{1}{2}$	for 10
		10	
1100900	6	6	for 10 × 10 or 100
		10	
11009003	2	6	for 100 × 10 or 1000
		2	
22018006	5	0	for 1000 × 2 or 2000
3302700	18	9	for 100 × 3 or 300
330270	1	$10\frac{1}{2}$	for 10 × 3 or 30
33027	0	$2\frac{1}{4}$	for 3
25684004	5	$9\frac{3}{4}$	for 2333

(11)

yds.	ft.	in.
8	0	10
		4
33	0	4

yds.	ft.	in.
8	0	10
		7
57	2	10

yds.	ft.	in.	
8	0	10	
		4	
33	0	4	for 4
		10	
331	0	4	for 4 × 10 or 40
8	0	10	for 1
322	2	6	for 39

subtract

yds.	ft.	in.	
8	0	10	
		4	
33	0	4	for 4
		12	
397	1	0	for 4 × 12 or 48

yds.	ft.	in.	
8	0	10	
		12	
99	1	0	for 12
		8	
794	2	0	for 12 × 8 or 96
57	2	10	for 7
852	1	10	for 103

(12)

mi.	fur.	po.	yds.
3	4	35	4
			3
10	6	27	1

mi.	fur.	po.	yds.
8	4	35	4
			8
28	7	5	$4\frac{1}{2}$

mi.	fur.	po.	yds.
3	4	35	4
			9
32	4	1	3

mi.	fur.	po.	yds.	
3	4	35	4	
			8	
28	7	5	$4\frac{1}{2}$	for 8
			2	
57	6	11	$3\frac{1}{2}$	for 8 × 2 or 16
10	6	27	1	for 3
68	4	38	$4\frac{1}{2}$	for 19

mi.	fur.	po.	yds.	
3	4	35	4	
			3	
10	6	27	1	for 3
			5	
54	1	15	5	for 3 × 5 or 15
			10	
541	5	39	$0\frac{1}{2}$	for 15 × 10 or 150
21	5	14	2	for 6
563	3	13	$2\frac{1}{2}$	for 156

(13)

lbs.	oz.	drs.	sc.
44	7	0	2
			5
222	11	3	1

lbs.	oz.	drs.	sc.
44	7	0	2
			11
490	5	7	1

lbs.	oz.	drs.	sc.	
44	7	0	2	
			4	
178	4	2	2	for 4
			4	
713	5	2	2	for 4×4 or 16
44	7	0	2	for 1
758	0	3	1	for 17

lbs.	oz.	drs.	sc.	
44	7	0	2	
			4	
178	4	2	2	for 4
			7	
1248	6	2	2	for 4×7 or 28

lbs.	oz.	drs.	sc.	
44	7	0	2	
			10	
445	10	6	2	for 10
			10	
4459	0	2	2	for 10×10 or 100
			3	
13377	1	0	0	for 100×3 or 300
1337	8	4	0	for 10×3 or 30
44	7	0	2	for 1
14759	4	4	2	for 331

(14)

tons	cwt.	lbs.	oz.
7	8	17	4
			7
51	17	8	12

tons	cwt.	lbs.	oz.	
7	8	17	4	
			4	
29	12	69	0	for 4
			3	
88	17	95	0	for 4×3 or 12
7	8	17	4	for 1
96	6	0	4	for 13

tons	cwt.	lbs.	oz.	
7	8	17	4	
			3	
22	4	51	12	for 3
			6	
133	6	86	8	for 6 × 3 or 18

= 133 tons, 6 cwt. 3 qrs. 2 lbs. 8 oz.

tons	cwt.	lbs.	oz.	
7	8	17	4	
			4	
29	12	69	0	for 4
			6	
177	15	78	0	for 4 × 6 or 24
14	16	34	8	for 2
192	12	0	8	for 26

tons	cwt.	lbs.	oz.	
7	8	17	4	
			10	
74	1	60	8	for 10
			10	
740	15	45	0	for 10 × 10 or 100
			5	
3703	17	1	0	for 100 × 5 or 500
148	3	9	0	for 10 × 2 or 20
51	17	8	12	for 7
3903	17	18	12	for 527

(15)

lbs.	oz.	dwts.	grs.
43	3	15	10
			2
86	7	10	20

lbs.	oz.	dwts.	grs.
43	3	15	10
			5
216	6	17	2

lbs.	oz.	dwts.	grs.	
43	3	15	10	
			2	
86	7	10	20	for 2
			7	
606	4	15	20	for 2 × 7 or 14

lbs.	oz.	dwts.	grs.	
43	3	15	10	
			5	
216	6	17	2	for 5
			9	
1949	1	13	18	for 5 × 9 or 45
86	7	10	20	for 2
2035	9	4	14	for 47

lbs.	oz.	dwts.	grs.	
43	3	15	10	
			12	
519	9	5	0	for 12
			7	
3638	4	15	0	for 12 × 7 or 84
43	3	15	10	for 1
3595	0	19	14	for 83

(16)

ac.	ro.	po.	
13	1	3	
		11	
145	3	33	

ac.	ro.	po.	
13	1	3	
		3	
39	3	9	for 3
		5	
199	0	5	for 3 × 5 or 15

ac.	ro.	po.	
13	1	3	
		7	
92	3	21	for 7
		7	
650	0	27	for 7 × 7 or 49

ac.	ro.	po.	
13	1	3	
		7	
92	3	21	for 7
		8	
743	0	8	for 7 × 8 or 56
13	1	3	for 1
756	1	11	for 57

ac.	ro.	po.	
13	1	3	
		10	
132	2	30	for 10
		10	
1326	3	20	for 10 × 10 or 100
66	1	15	for 5
1393	0	35	for 105

(17)

ac.	ro.	po.	yds.	ft.
7	0	38	17	1
				6
43	1	31	$11\frac{1}{4}$	6

ac.	ro.	po.	yds.	ft.
7	0	38	17	1
				10
72	1	25	$19\frac{3}{4}$	1

ac.	ro.	po.	yds.	ft.	
7	0	38	17	1	
				10	
72	1	25	$19\frac{3}{4}$	1	for 10
				2	
144	3	11	$9\frac{1}{2}$	2	for 10×2 or 20
21	2	35	$20\frac{3}{4}$	3	for 3
166	2	6	30	5	for 23

ac.	ro.	po.	yds.	ft.	
7	0	38	17	1	
				12	
86	3	22	$23\frac{1}{4}$	3	for 12
				3	
260	2	28	11	0	for 3×12 or 36
14	1	37	$3\frac{3}{4}$	2	for 2
275	0	25	$14\frac{3}{4}$	2	for 38

ac.	ro.	po.	yds.	ft.	
7	0	38	17	1	
				12	
86	3	22	$23\frac{1}{4}$	3	for 12
				2	
173	3	5	$16\frac{3}{4}$	6	for 12×2 or 24
				10	
1737	3	15	$22\frac{1}{4}$	6	for 24×10 or 240

(18)

lds.	qrs.	bus.	pks.
5	3	5	2
			4
22	4	6	0

lds.	qrs.	bus.	pks.	
5	3	5	2	
			3	
17	1	0	2	for 3
			7	
120	2	3	2	for 3×7 or 21

lds.	qrs.	bus.	pks.	
5	3	5	2	
			8	
45	4	4	0	for 8
			8	
367	1	0	0	for 8×8 or 64
5	3	5	2	for 1
372	4	5	2	for 65

lds.	qrs.	bus.	pks.	
5	3	5	2	
			12	
68	4	2	0	for 12
			10	
688	2	4	0	for 12×10 or 120
22	4	6	0	for 4
711	2	2	0	for 124

lds.	qrs.	bus.	pks.	
5	3	5	2	
			10	
57	1	7	0	for 10
			10	
573	3	6	0	for 10×10 or 100
			3	
1721	1	2	0	for 100×3 or 300
34	2	1	0	for 6
1755	3	3	0	for 306

(19)

bar.	gal.	pt.
43	8	1
		4
172	32	4

bar.	gal.	pt.	
43	8	1	
		4	
172	32	4	for 4
		5	
864	18	4	for 4×5 or 20
subtract 43	8	1	for 1
821	10	3	for 19

=821 bar. 10 gal. 1 qt. 1 pt.

bar.	gal.	pt.	
43	8	1	
		4	
172	32	4	for 4
		7	
1210	11	4	for 4 × 7 or 28
43	8	1	for 1
1253	19	5	for 29

1253 bar. 19 gal. 2 qts. 1 pt.

bar.	gal.	pt.	
43	8	1	
		10	
432	9	2	for 10
		10	
4322	20	4	for 10 × 10 or 100
		4	
17290	10	0	for 100 × 4 or 400
3025	28	6	for 10 × 7 or 70
129	24	3	for 3
20445	27	1	for 473

bar.	gal.	pt.	
43	8	1	
		10	
432	9	2	for 10
		10	
4322	20	4	for 10 × 10 or 100
		7	
30257	35	4	for 100 × 7 or 700

30257 bar. 35 gals. 2 qts.

(20)

wks.	dys.	hrs.	mi.		wks.	dys.	hrs.	mi.	
17	4	23	47		17	4	23	47	
			3					4	
53	0	23	21		70	5	23	8	for 4
								8	
					566	5	17	4	for 4 × 8 or 32

wks.	dys.	hrs.	mi.	
17	4	23	47	
			8	
141	4	22	16	for 8
			7	
991	6	11	52	for 8 × 7 or 56

wks.	dys.	hrs.	mi.	
17	4	23	47	
			10	
177	0	21	50	for 10
			7	
1239	6	8	50	for 10 × 7 or 70
17	4	23	47	for 1
1257	4	8	37	for 71

wks.	dys.	hrs.	mi.	
17	4	23	47	
			4	
70	5	23	8	for 4
			8	
536	5	17	4	for 4 × 8 or 32
			4	
2267	1	20	16	for 32 × 4 or 128
123	6	22	29	for 7
2391	1	18	45	for 135

2. Sum given to each person = 14*s.* 9*d.* − 9*s.* 6*d.* = 5*s.* 3*d.*
∴ money given away = 5*s.* 3*d.* × 42 = £11. 0*s.* 6*d.*
whole amount to lay out = 14*s.* 9*d.* × 42 = £30. 19*s.* 6*d.*

3. No. of miles walked = 14 × 6 × 52 = 4368,
earnings = 2*s.* 6*d.* × 6 × 52 = £39.

4. Sum lost on each £ = £1 − 15*s.* 6½*d.* = 4*s.* 5½*d.*,
∴ sum lost on £750 = 4*s.* 5½*d.* × 750 = £167. 19*s.* 4½*d.*

5. Cost of 236 qrs. of wheat at £2. 2*s.* = £2. 2*s.* × 236
= £495. 12*s.*
wharfage = (236 × 8 × 4)*d.* = £ 31. 9*s.* 4*d.*;
∴ entire cost of 236 qrs. of wheat = £527. 1*s.* 4*d.*,
150 qrs. at £2. 8*s.* = £2. 8*s.* × 150 = £360,
86 qrs. at £2. 12*s.* 6*d.* = £2. 12*s.* 6*d.* × 86 = £225. 15*s.*
∴ produce of sale of 236 qrs. of wheat = £585. 15*s.*
∴ gain = £585. 15*s.* − £527. 1*s.* 4*d.* = £58. 13*s.* 8*d.*

6. Cost per mile $= 1\frac{3}{4} \times 7d. + 1\frac{1}{4} \times 3d. + \frac{3}{4} \times 4d.$
$= 1s.\ 0\frac{1}{4}d. + 3\frac{3}{4}d. + 3d. = 1s.\ 7d.$
$\therefore$ entire cost $= 1s.\ 7d. \times 559 = £44.\ 5s.\ 1d.$
cost per mile in 2nd case $= 1\frac{3}{4} \times 3d. + 1\frac{1}{4} \times 7d. + \frac{3}{4} \times 2d.$
$= 5\frac{1}{4}d. + 8\frac{3}{4}d. + 1\frac{1}{2}d. = 1s.\ 3\frac{1}{2}d.$
$\therefore$ cost per mile in 2nd case less than in 1st $= 1s.\ 7d. - 1s.\ 3\frac{1}{2}d. = 3\frac{1}{2}d.$
$\therefore$ whole cost in 2nd case less than in 1st $= 3\frac{1}{2}d. \times 559 = £8.\ 3s.\ 0\frac{1}{2}d.$

7. Since $32016 \div 2 = 16008$,
entire gain $= (8004 \times \frac{1}{4}d. + 8004 \times \frac{1}{4}d.) \times 20 \times 112$
$= (4002d. + 2001d.) \times 20 \times 112$
$= (6003 \times 20 \times 112)d.$
$= £56028.$

8. 8 min. 13 sec. $= 493$ sec.
$\therefore$ the Sun's distance from the Earth $= (192000 \times 493)$ m.
$= 94656000$ m.

9. Cost of paper $= 13s.\ 9d. \times 45 + 10s.\ 6d.$
$= £30.\ 18s.\ 9d. + 10s.\ 6d. = £31.\ 9s.\ 3d.$
produce of sale $= 1s.\ 2d. \times 18 \times 45 + 6d. \times 2 \times 45$
$= £47.\ 5s. + £2.\ 5s. = £49.\ 10s.$
$\therefore$ gain $= £49.\ 10s. - £31.\ 9s.\ 3d. = £18.\ 0s.\ 9d.$

10. (1)

		s.	d.
11 lbs. of beef at $7\frac{1}{2}d.$ a lb.	=	6	$10\frac{1}{2}$
13 lbs. of mutton at $7d.$	=	7	7
15 lbs. of veal at $8\frac{1}{4}d.$	=	10	$3\frac{3}{4}$
26 lbs. of pork at $6\frac{3}{4}d.$	=	14	$7\frac{1}{2}$
		£1 19	$4\frac{3}{4}$

(2)

	£	s.	d.
5 pairs of blankets at $13s.\ 6d.$ a pair	= 3	7	6
18 glass-cloths at $10\frac{1}{2}d.$ each	= 0	15	9
29 yds. of muslin at $1s.\ 10\frac{1}{2}d.$ a yd.	= 2	14	$4\frac{1}{2}$
13 pairs of stockings at $1s.\ 6\frac{1}{2}d.$ a pair	= 1	0	$0\frac{1}{2}$
8 yds. of flannel at $1s.\ 9\frac{1}{2}d.$ a yd.	= 0	14	4
	8	12	0

11.

	£	s.	d.
15 yds. of damask at $4s.\ 9d.$ a yd.	= 3	11	3
28 yds. of gimp at $10\frac{1}{2}d.$ a yd.	= 1	4	6
24 rings at $4s.\ 3d.$ per dozen	= 0	8	6
24 hooks at $1\frac{1}{4}d.$ per dozen	= 0	0	$3\frac{1}{2}$
2 days at $2s.\ 3d$	= 0	4	6
	5	9	$0\frac{1}{2}$

12.

	£	*s.*	*d.*
23 yds. of silk at 5*s.* 6*d.* a yd. .	= 6	6	6
33 yds. of calico at 11½*d.* a yd. .	= 1	11	7½
24 pairs of gloves at 2*s.* 7*d.* a pair	= 3	2	0
10 yds. of ribbon at 1*s.* 10*d.* a yd.	= 0	18	4
	11	18	5½

error = £11. 18*s.* 5½*d.* − £11. 17*s.* 8¼*d.* = 9¼*d.*

Ex. XXI. Page 81.

1. 250*fr.* 4*c.* = 25004*c.*

25
125020
50008
625100*c.* = 6251*fr.*

65*fr.* 35*c.* = 6535*c.*

46
39210
26140
300610*c.* = 3006*fr.* 10*c.*

8 kilog. 6 hectog. 97 gram. = 8697 gr.

37
60879
26091
321789 gr.

= 321 kilog. 7 hectog. 8 décag. 9 gr.

24 hectar. 2 ares, 9 centiar. = 240209 centiar.

76
1441254
1681463
18255884 centiar.

= 1825 hectar. 58 ares. 85 centiar.

décist.
258
425
1290
516
1032
109650 décist. = 1096 décast. 5 st.

millim.
1 myriam. 1 hectom. 1 millim. = 10100001
12
121200012

12 myriam. 12 hectom. 12 millim.

2. Daily saving = (550 − 375)*c.* = 175*c.*;

∴ yearly saving = (175 × 366)*c.* = 64050*c.* = 640*fr.* 50*c.*

3. Fare = (507 × 13)*c.* = 6591*c.* = 65*fr.* 91*c.*

4. 2 hectar. 2 ares = 202 ares;

∴ No. of litres required = 132 × 202 = 26664
= 266 hectol. 64 lit.

5. Cost of 1st bullock = (135 × 382)*c.* = 51570*c.* = 515*fr.* 70*c.*
..... 2nd ..... = (125 × 341)*c.* = 42625*c.* = 426*fr.* 25*c.*
..... cow..... = (95 × 280)*c.* = 26600*c.* = 266*fr.*
..... calf..... = (175 × 59)*c.* = 10325*c.* = 103*fr.* 25*c.*
131120*c.*
= 1311*fr.* 20*c.*

6. In 100 revolutions it goes over (85 × 45) décim.;

∴ in 5610 ..... (85 × 45 × 561) décim.
= 2145825 décim.
= 214 kilom. 5 hectom. 8 décam. 2 m. 5 décim.

7. Each boy receives daily $175c.$
$\therefore$ each woman..... 350
$\therefore$ each man 525

$\therefore$ daily earnings $= (175 \times 20 + 350 \times 40 + 525 \times 65)c.$
$= (3500 + 14000 + 34125)c.$
$= 51625c.;$

$\therefore$ yearly earnings $= (51625 \times 6 \times 52)c.$
$= 16107000c.$
$= 161070fr.$

COMPOUND DIVISION.—Ex. XXII. Page 84.

1. (1)

	£	s.
2)	611	8
	305	14

	£	s.
3)	611	8
	203	16

	£	s.	d.
8)	611	8	0
	76	8	6

	£	s.
12)	611	8
	50	19

(2)

	£	s.	d.
4)	187	10	9
	46	17	$8\frac{1}{4}$

	£	s.	d.
6)	187	10	9
	31	5	$1\frac{1}{2}$

	£	s.	d.
9)	187	10	9
	20	16	9

	£	s.	d.	£
36)	187	10	9	(5
	180			
	7			
	20			
36)	150			(4s.
	144			
	6			
	12			
36)	81			(2d.
	72			
	9			
	4			
36)	36			(1q.
	36			

Quotient $= £5.\ 4s.\ 2\frac{1}{4}d.$

(3)

	£	s.	d.
3 |	5403	10	0
	1801	8	4

	£	s.	d.
8 |	5403	10	0
	675	8	9

32) 5403 10 (£168
32
220
192
283
256
27
20
32) 550 (17s.
32
230
224
6
12
32) 72 (2d.
64
8
4
32) 32 (1q.
32

Quotient = £168. 17s. 2¼d.

48) 5403 10 (£112
48
60
48
123
96
27
20
48) 550 (11s.
48
70
48
22
12
48) 264 (5d.
240
24
4
48) 96 (2q.
96

Quotient = £112. 11s. 5½d.

(4)

	£	s.	d.
3)	4844	11	4½
	1614	17	1½

	£	s.	d.
7)	4844	11	4½
	692	1	7½

	£	s.	d.
9)	4844	11	4½
	538	5	8½

63) 4844 11 4½ (£76
441
434
378
56
20
63) 1131 (17*s.*
63
501
441
60
12
63) 724 (11*d.*
63
94
63
31
4
63) 126 (2*q.*
126

Quotient = £76. 17*s.* 11½*d.*

(5)

	£	s.	d.
5)	10806	2	6
	2161	4	6

	£	s.	d.	£
165)	10806	2	6	(65
	990			
	906			
	825			
	81			
	20			
165)	1622			(9s.
	1485			
	137			
	12			
165)	1650			(10d.
	165			

Quotient = £65. 9s. 10d.

	£	s.	d.
11)	10806	2	6
	982	7	6

	£	s.	d.	£
66)	10806	2	6	(163
	66			
	420			
	396			
	246			
	198			
	48			
	20			
66)	962			(14s.
	66			
	302			
	264			
	38			
	12			
66)	462			(7d.
	462			

Quotient = £163. 14s. 7d.

(6)

	£	s.	d.
3)	8140	17	6
	2713	12	6

	£	s.	d.	£
13)	8140	17	6	(626
	78			
	34			
	26			
	80			
	78			
	2			
	20			
13)	57			(4s.
	52			
	5			
	12			
13)	66			(5d.
	65			
	1			

Quotient = £626. 4s. 5d. rem. 1d.

£	s.	d.	£
17) 8140	17	6	(478
68			
134			
119			
150			
136			
14			
20			
17) 297			(17s.
17			
127			
119			
8			
12			
17) 102			(6d.
102			

Quotient = £478. 17s. 6d.

£	s.	d.	£
204) 8140	17	6	(39
612			
2020			
1836			
184			
20			
204) 3697			(18s.
204			
1657			
1632			
25			
12			
204) 306			(1d.
204			
102			
4			
204) 408			(2q.
408			

Quotient = £39. 18s. 1½d.

(7)

£	s.	d.
5) 3676	13	10¼
735	6	9¼

£	s.	d.	£
25) 3676	13	10¼	(147
25			
117			
100			
176			
175			
1			
20			
25) 33			(1s.
25			
8			
12			
25) 106			(4d.
100			
6			
4			
25) 25			(1q.
25			

Quotient = £147. 1s. 4¼d.

£	s.	d.	£
57) 3676	13	10¼ (	64
342			
256			
228			
28			
20			
57) 573 (	10s.		
57			
3			
12			
46			
4			
57) 185 (	3q.		
171			
14			

Quotient = £64. 10s. 0¾d. rem. 14q.

£	s.	d.	£
275) 3676	13	10¼ (	13
275			
926			
825			
101			
20			
275) 2033 (	7s.		
1925			
108			
12			
275) 1306 (	4d.		
1100			
206			
4			
275) 825 (	3q.		
825			

Quotient = £13. 7s. 4¾d.

£	s.	d.	£
(8) 6) 3636504	10	1½	
606084	1	8½	

£	s.	d.	£
14) 3636504	10	1½ (	259750
28			
83			
70			
136			
126			
105			
98			
70			
70			
4			
20			
14) 90 (	6s.		
84			
6			
12			
14) 73 (	5d.		
70			
3			
4			
14) 14 (	1q.		
14			

Quotient = £259750. 6s. 5¼d.

£ s. d. £
29) 3636504 10 1½ (125396
29
73
58
156
145
115
87
280
261
194
174
20
20
29) 410 (14s.
29
120
116
4
12
29) 49 (1d.
29
20
4
29) 82 (2q.
58
24

Quotient = £125396. 14s. 1½d. rem. 24q.

£ s. d. £
1803) 3636504 10 1½ (2016
3606
3050
1803
12474
10818
1656
20
1803) 33130 (18s.
1803
15100
14424
676
12
1803) 8113 (4d.
7212
901
4
1803) 3606 (2q.
3606

Quotient = £2016. 18s. 4½d.

(9)

	fur.	po.	yds.	ft.	in.
4)	2	10	1	1	10
	22	3	0	5 rem. 2 in.	

	fur.	po.	yds.	ft.	in.
7)	2	10	1	1	10
	12	4	2	10	

	fur.	po.	yds.	ft.	in.
	2	10	1	1	10
	40				
14)	90	(6 po.			
	84				
	6				
	5½				
	31				
	3				
14)	34	(2 yds.			
	28				
	6				
	3				
14)	19	(1 ft.			
	14				
	5				
	12				
14)	70	(5 in.			
	70				

Quotient = 6 po. 2 yds. 1 ft. 5 in.

	fur.	po.	yd.	ft.	in.
	2	10	1	1	10
	40				
35)	90	(2 po.			
	70				
	20				
	5½				
	101				
	10				
35)	111	(3 yds.			
	105				
	6				
	3				
	19				
	12				
35)	238	(6 in.			
	210				
	28				

Quotient = 2 po. 3 yds. 6 in. rem. 28 in.

(10)

	tons	cwt.	qrs.	lbs.	oz.
4)	228	18	3	13	12
	57	4	2	24	7

11)

tons	cwt.	qrs.	lbs.	oz.
228	18	3	13	12
20	16	1	1	4

19) 228 tons 18 cwt. 3 qrs. 13 lbs. 12 oz. (12 tons

19
38
38
19) 18 (0 cwt.
4
19) 75 (3 qrs.
57
18
28
157
36
19) 517 (27 lbs.
38
137
133
4
16
19) 76 (4 oz.
76

Quot. = 12 tons 3 qrs. 27 lbs. 4 oz.

76) 228 tons 18 cwt. 3 qrs. 13 lbs. 12 oz. (3 tons
228
18 cwt.
4
75 qrs.
28
613
150
76) 2113 (27 lbs.
152
593
532
61
16
378
61
76) 988 (13 oz.
76
228
228

Quotient = 3 tons 27 lbs. 13 oz.

(11)

	lbs.	oz.	dwts.	grs.
2)	459	4	5	22
	229	8	2	23

	lbs.	oz.	dwts.	grs.	
11)	459	4	5	22	
	41	9	2	8	rem. 6 grs.

29) 459 lbs. 4 oz. 5 dwts. 22 grs. (15 lbs.
29
169
145
24
12
29) 292 (10 oz.
29
2
20
29) 45 (1 dwt.
29
16
24
86
32
29) 406 (14 grs.
29
116
116

Quot.=15 lbs. 10 oz. 1 dwt. 14 grs.

67) 459 lbs. 4 oz. 5 dwts. 22 grs. (6 lbs.
402
57
12
67) 688 (10 oz.
67
18
20
67) 365 (5 dwts.
335
30
24
67) 742 (11 grs.
67
72
67
5

Quotient = 6 lbs. 10 oz. 5 dwts. 11 grs. rem. 5 grs.

(12)

	lbs.	oz.	drs.	scr.
5)	15511	3	6	2
	3102	3	1	1

	lbs.	oz.	drs.	scr.	lbs.
17)	15511	3	6	2	(912
	153				
	21				
	17				
	41				
	34				
	7				
	12				
17)	87				(5 oz.
	85				
	2				
	8				
17)	22				(1 dr.
	17				
	5				
	3				
17)	17				(1 scr.
	17				

Quotient = 912 lbs. 5 oz. 1 dr. 1 scr.

	lbs.	oz.	drs.	scr.	lbs.
68)	15511	3	6	2	(228
	136				
	191				
	136				
	551				
	544				
	7				
	12				
68)	87				(1 oz.
	68				
	19				
	8				
68)	158				(2 drs.
	136				
	22				
	3				
68)	68				(1 scr.
	68				

Quotient = 228 lbs. 1 oz. 2 drs. 1 scr.

lbs. oz. drs. scr. lbs.

111) 15511 8 6 2 (139

111

441

333

1081

999

82

12

111) 987 (8 oz.

888

99

8

111) 798 (7 drs.

777

21

3

65

20

111) 1800 (11 grs.

111

190

111

79

Quotient = 139 lbs. 8 oz. 7 drs. 11 grs. rem. 79 grs.

(13)

	ac.	ro.	po.	in.
3)	227	3	37	48
	75	3	39	16

	ac.	ro.	po.	yds.	ft.	in.
6)	227	3	37	0	0	48
	37	3	39*	15	1*	26

* *Note.* $\frac{3}{4}$ sq. yd. = 6 sq. ft. 108 sq. in.

$\therefore$ $\frac{3}{4}$ sq. yd. 48 sq. in. = 6 sq. ft. 156 sq. in.

ac.	ro.	po.	yds.	ft.	in.	ac.
13) 227	3	37	0	0	48	(17
13						
97						
91						
6						
4						
13) 27	(2 ro.					
26						
1						
40						
13) 77	(5 po.					
65						
12						
30½						
360						
3						
13) 363	(27 yds.					
26						
103						
91						
12						
9						
13) 108	(8 ft.					
104						
4						
144						
13) 624	(48 in.					
52						
104						
104						

Quotient = 17 ac. 2 ro. 5 po. 27 yds. 8 ft. 48 in.

ac. ro. po. sq. in. ac.
52) 227 3 37 48 (4
208
19
4
52) 79 (1 ro.
52
27
40
52) 1117 (21 po.
104
77
52
25
30½
750
6½
756½*

* *Note.* ½ sq. yd. = 2 ft. 36 in. ∴ ½ sq. yd. 48 in. = 2 ft. 84 in.

yds. ft. in. sq. in.
52) = 756 2 84 adding the 48 (14 sq. yds.
52
236
208
28
9
52) 254 (4 sq. ft.
208
46
144
184
184
46
84
52) 6708 (129 sq. in.
52
150
104
468
468

Quotient = 4 ac. 1 ro. 21 po. 14 sq. yds. 4 sq. ft. 129 sq. in.

(14) 8) ac. ro. po.
40380 2 32
5047 2 14

ac. ro. po. ac.
24) 40380 2 32 (1682
24
168
144
198
192
60
48
12
4
24) 50 (2 ro.
48
2
40
24) 112 (4 po.
96
16
30¼
480
4
24) 484 (20 sq. yds.
48
4
9
24) 36 (1 sq. ft.
24
12
144
24) 1728 (72 sq. in.
168
48
48

Quotient = 1682 ac. 2 ro. 4 po. 20 sq. yds. 1 sq. ft. 72 sq. in.

ac. ro. po. ac.
53) 40380 2 32 (761
371
328
318
100
53
47
4
53) 190 (3 ro.
159
31
40
53) 1272 (24 po.
106
212
212

Quotient = 761 ac. 3 ro. 24 po.

ac. ro. po. ac.
107) 40380 2 32 (377
321
828
749
790
749
41
4
107) 166 (1 ro.
107
59
40
107) 2392 (22 po.
214
252
214
38
30¼
1140
9½
1149½
sq. yds. sq. ft. sq. in. sq. yds.
107) 1149 4 72 (10
107
79
9
107) 715 (6 sq. ft.
642
73
144
292
292
73
72
107) 10584 (98 sq. in.
963
954
856
98

Quotient = 377 ac. 1 ro. 22 po. 10 sq. yds. 6 sq. ft. 98 sq. in.
rem. 98 sq. in.

(15) 6 | lds. 3681 — qrs. 2 — bus. 4
613

48) lds. 3681 (lds. 76
336
321
288
33
5

48) 165 (3 qrs.
144
21
8

48) 168 (3 bus.
144
24
4

48) 96 (2 pks.
96

Quotient = 76 lds. 3 qrs. 3 bus. 2 pks.

15) lds. 3681 (lds. 245
30
68
60
81
75
6
5

15) 30 (2 qrs.
30

Quotient = 245 lds. 2 qrs.

224) lds. 3681 (lds. 16
224
1441
1344
97
5

224) 485 (2 qrs.
448
37
8

224) 296 (1 bus.
224
72
4

224) 288 (1 pk.
224
64

Quotient = 16 lds. 2 qrs. 1 bus. 1 pk. rem. 64 pks.

(16)

	yrs.	wks.	d.	hrs.	m.
3)	38	46	2	13	6
	12	50	0	20	22

	yrs.	wks.	d.	hrs.	m.	yr.
36)	38	46	2	13	6 (	1
	36					
	2					
	52					
36)	150 (	4 wks.				
	144					
	6					
	7					
36)	44 (	1 d.				
	36					
	8					
	24					
36)	205 (	5 hrs.				
	180					
	25					
	60					
36)	1506 (	41 m.				
	144					
	66					
	36					
	30					
	60					
36)	1800 (	50 sec.				
	180					

Quotient = 1 yr. 4 wks. 1 d. 5 hrs. 41 m. 50 sec.

yrs.	wks.	d.	hrs.	m.
38	46	2	18	6

```
                52
                76
               190
                46
54 ) 2022 ( 37 wks.
       162
       402
       378
        24
         7
54 ) 170 ( 3 d.
       162
         8
        24
54 ) 205 ( 3 hrs.
       162
        43
        60
54 ) 2586 ( 47 m.
       216
       426
       378
        48
        60
54 ) 2880 ( 53 sec.
       270
       180
       162
        18
```

Quotient = 37 wks. 3 d. 3 hrs. 47 m. 53 sec. rem. 18 sec.

yrs.	wks.	d.	hrs.	m.
38	46	2	13	6

52
76
190
46
339) 2022 (5 wks.
1695
327
7
339) 2291 (6 d.
2034
257
24
1041
514
339) 6181 (18 hrs.
339
2791
2712
79
60
339) 4746 (14 m.
339
1356
1356

Quotient = 5 wks. 6 d. 18 hrs. 14 m.

2. £500 − £198. 17*s*. 6*d*. = £301. 2*s*. 6*d*.

£	*s*.	*d*.
301	2	6

20
365) 6022 (16*s*.
365
2372
2190
182
12
365) 2190 (6*d*.
2190

Average daily expenditure = 16*s*. 6*d*.

	£	s.	d.
3. Weekly wages of 9 men and 13 women =	11	12	6
∴ daily wages of ..... =	11	12	6÷6
=	1	18	9

Now wages of 1 man = wages of 2 women;

∴ wages of 9 men = wages of 18 women;

	£	s.	d.
∴ daily wages of 18 women and 13 women =	1	18	9
or ..... 31 ..... =	1	18	9
∴ ..... 1 ..... =	1	18	9÷31
=	0	1	3

∴ daily wages of each man = 1*s.* 3*d.* × 2 = 2*s.* 6*d.*

4. 3 pipes = 3 × 2 × 63 = 378 gal. gal.

£ s. d.
22 16 9
20
378) 456 (1*s.*
378
78
12
378) 945 (2*d.*
756
189
4
378) 756 (2*q.*
756

∴ duty per gallon = 1*s.* 2½*d.*

5.

m.	yds.	ft.
5	2600	2
1760		
8800		
2600		

2094) 11400 (5 yds.
10470
930
3
2094) 2792 (1 ft.
2094
698
12
2094) 8376 (4 in.
8376

∴ average distance per stroke = 5 yds. 1 ft. 4 in.

6.

		oz.	oz.	lbs.	oz.	dwts.
Weight of cups	=	10 × 7 = 70	=	5	10	0
	oz.	dwts.	oz.	dwts.		
..... forks	= 2	8 × 21 = 50	8 =	4	2	8
	oz.		oz.			
..... spoons =		3 × 13 = 39	=	3	3	0
∴ weight of stolen silver =				13	3	8

Since one thief has a double share, we must divide 13 lbs. 3 oz. 8 dwts. into 4 equal parts, giving one thief 2 parts, and each of the others 1 part.

lbs.	oz.	dwts.
4 | 13	3	8
3	3	17
		2
6	7	14

therefore share of one thief = 6 lbs. 7 oz. 14 dwts., and share of each of the other thieves = 3 lbs. 3 oz. 17 dwts.

7. (7 × 36) or 252 gals. cost £14. 14*s.*

gain = £8;

∴ he must sell (252 − 25) or 227 gals. for £22. 14*s.*
..... 1 gal. for £22. 14*s.* ÷ 227 or 2*s.*
..... 1 pint for 2*s.* ÷ 8 or 3*d.*

8. Worth in pence + worth in silver + worth in gold = £4. 18*s.* 8*d.*,

or 1 times worth in pence + 6 times worth in pence + 30 times worth in pence = 1184 pence;

∴ 37 times worth in pence = 1184 pence;

∴ worth in pence = 1184*d.* ÷ 37 = 32*d.* = 2*s.* 8*d.*
..... silver = 2*s.* 8*d.* × 6 = 16*s.*
..... gold = 16*s.* × 5 = £4.

Ex. XXIII. Page 88.

1.

£	*s.*	*d.*
4	6	$0\frac{1}{2}$

35) 86 (2*s.*
70
16
12
35) 192 (5*d.*
175
17
4
35) 70 (2*q.*
70

	£	*s.*	*d.*
35 | 5	4	6	$0\frac{1}{2}$
7		17	$2\frac{1}{2}$
		2	$5\frac{1}{2}$

Quotient in each case = 2*s.* $5\frac{1}{2}$*d.*

2. 27) £392 s. 11 d. 4½ (£14
27
122
108
14
20
27) 291 (10s.
27
21
12
27) 256 (9d.
243
13
4
27) 54 (2q.
54

Quotient in each case = £14. 10s. 9½d.

27	£	s.	d.
3	392	11	4½
9	130	17	1½
	14	10	9½

3. 36) £848 s. 10 d. 3 (£23
72
128
108
20
20
36) 410 (11s.
36
50
36
14
12
36) 171 (4d.
144
27
4
36) 108 (3q.
108

Quotient in each case = £23. 11. 4¾d.

36	£	s.	d.
3	848	10	3
12	282	16	9
	23	11	4¾

4.

£	s.	d.
91	11	6

$$\begin{array}{r} 20 \\ \hline 108\,)\,1831\,(16s. \\ 108 \\ \hline 751 \\ 648 \\ \hline 103 \\ 12 \\ \hline 108\,)\,1242\,(11d. \\ 108 \\ \hline 162 \\ 108 \\ \hline 54 \\ 4 \\ \hline 108\,)\,216\,(2q. \\ 216 \\ \hline \end{array}$$

$$108 \left\{ \begin{array}{c|ccc} 9 & £ & s. & d. \\ & 91 & 11 & 6 \\ \hline 12 & 10 & 3 & 6 \\ \hline & & 16 & 11\frac{1}{2} \end{array} \right.$$

Quotient in each case = 16*s.* 11½*d.*

5.

£	s.	d.
59	13	3

$$\begin{array}{r} 20 \\ \hline 66\,)\,1193\,(18s. \\ 66 \\ \hline 533 \\ 528 \\ \hline 5 \\ 12 \\ \hline 66\,)\,63\,(0d. \\ 4 \\ \hline 66\,)\,252\,(3q. \\ 198 \\ \hline 54 \end{array}$$

$$66 \left\{ \begin{array}{c|ccc} 6 & £ & s. & d. \\ & 59 & 13 & 3 \\ \hline 11 & 9 & 18 & 10\frac{1}{2} \\ \hline & & 18 & 0\frac{3}{4} \text{ rem. } 9q. \end{array} \right\} 54q.$$

Quotient in each case = 18*s.* 0¾*d.* rem. 54*q.*

6.

£	s.	d.	£
144) 203	19	$0\frac{3}{4}$ (	1
144			
59			
20			
144) 1199 (	8s.		
1152			
47			
12			
144) 564 (	3d.		
432			
132			
4			
144) 531 (	3q.		
432			
99			

	£	s.	d.	
144 { 12	203	19	$0\frac{3}{4}$	
{ 12	16	19	11	rem. 3q. } 99q.
	1	8	$3\frac{3}{4}$	rem. 8q. }

Quotient in each case = £1. 8s. $3\frac{3}{4}$d. rem. 99q.

7.

mi.	fur.	po.	mi.
28) 1361	4	28 (	48
112			
241			
224			
17			
8			
28) 140 (	5 fur.		
140			
28) 28 (	1 po.		
28			

	mi.	fur.	po.
28 { 4	1361	4	28
{ 7	340	3	7
	48	5	1

Quotient in each case = 48 mi. 5 fur. 1 po.

8.

		tons	cwt.	qrs.	lbs.	oz.	
84	12	687	0	2	15	0	
	7	57	5	0	5	14	rem. 8
		8	3	2	8	13	rem. 3

44 oz.

```
                tons  qrs.  lbs.  tons
84 ) 687      2     15  ( 8
     672
     ---
      15
      20
     ---
84 ) 300  ( 3 cwt.
     252
     ---
      48
       4
     ---
84 ) 194  ( 2 qrs.
     168
     ---
      26
      28
     ---
     223
      52
     ---
84 ) 743  ( 8 lbs.
     672
     ---
      71
      16
     ---
     426
      71
     ---
84 ) 1136 ( 13 oz.
      84
     ---
     296
     252
     ---
      44
```

Quotient in each case = 8 tons 3 cwt. 2 qrs. 8 lbs. 13 oz. and 44 oz. rem.

9.

sq. yds. ft. in.
64 1 72
9

132) 577 (4 sq. ft.
528
49
144
196
196
49
72

132) 7128 (54 sq. in.
660
528
528

sq. yds. ft. in.
132 { 12 | 64 1 72
11 | 5 3 18
4 54

Quotient in each case = 4 sq. ft. 54 sq. in.

10.

cub. yds. ft. in. cub. yds.
64) 1764 5 4 (27
128
484
448
36
27
257
72

64) 977 (15 cub. ft.
64
337
320
17
1728
140
34
119
17

64) 29380 (459 cub. in.
256
378
320
580
576
4

cub. yds. ft. in.
64 { 8 | 1764 5 4
8 | 220 14 216 rem. 4 } c. in. 4
27 15 459 rem. 0

Quotient in each case = 27 cub. yds. 15 cub. ft. 459 cub. in. rem. 4 cub. in.

11.

lds. qrs. bus.
2 4 7
5
14
8
48) 119 (2 bus.
96
23
4
48) 92 (1 pk.
48
44

	lds.	qrs.	bus.	pks.		
8	2	4	7	0		
6		1	6	3	rem. 4	pks. 44
			2	1	rem. 5	

48

Quotient in each case = 2 bus. 1 pk. rem. 44 pks.

12.

lbs. oz. dwts. grs. lbs.
77) 178 9 19 23 (2
154
24
12
77) 297 (3 oz.
231
66
20
77) 1839 (17 dwts.
77
569
539
30
24
77) 743 (9 grs.
693
50

	lbs.	oz.	dwts.	grs.		
11	178	9	19	23		
7	16	3	1	19	rem. 6	50 grs.
	2	3	17	9	rem. 4	

77

Quotient in each case = 2 lbs. 3 oz. 17 dwts. 9 grs. rem. 50 grs.

Ex. XXIV. Page 89.

1. (1)

£	s.	d.
58,6	13	9

20

s. 13,3

12

d. 4,5

4

q. 2,0

Quotient is £58. 13*s*. 4½*d*.

£	s.	d.
45,31	17	6

20

s. 6,37

12

d. 4,50

4

q. 2,00

Quotient is £45. 6*s*. 4½*d*.

(2)

£	s.	d.
4,095	17	3½

20

s. 1,917

12

d. 11,007

4

30

Quotient is £4. 1*s*. 11*d*. and 30*q*. rem.

15 | 3 | 5

£	s.
138	15
46	5
9	5

20

s. 18,5

12

d. 6,0

Quotient is 18*s*. 6*d*.

(3)

sc.	ro.	po.
43	3	17

4

ro. 1,75

40

po. 30,17

30½

510

4½

sq. yds. 5,14½

sq. yds.	ft.	in.
=14	2	36

9

sq. ft. 1,28

144

112

112

28

36

sq. in. 40,68

Quotient = 1 ro. 30 po. 5 sq. yds. 1 sq. ft. 40 sq. in. 68 sq. in. rem.

64 | 8 | 8

£	s.	d.
546	13	4
68	6	8
8	10	10

20

s. 1,70

12

d. 8,50

4

q. 2,00

Quotient = 1*s*. 8½*d*.

2. £79062. 10*s.* ÷ 60000 = price of bricks per thousand.

	£	*s.*	*d.*
6)	79062	10	0
	£1,3177	1	8
	20		
	s. 6,3541		
	12		
	d. 4,2500		
	4		
	q. 1,0000		

∴ price per thousand = £1. 6*s.* 4½*d.*

Ex. XXV. Page 90.

1. £40. 10*s.* 4*d.* = 9724*d.*
£1. 11*s.* 2*d.* = 374*d.*
∴ No. of persons = 9724 ÷ 374 = 26.

2. 3 m. = (3 × 1760 × 3 × 12) in. = 190080 in.
2 ft. 3 in. = 27 in.
∴ No. of turns = 190080 ÷ 27 = 7040.

3. 11 lbs. 3oz. = 2700 dwts.
2 oz. 10 dwts. = 50 dwts.
∴ No. of spoons = 2700 ÷ 50 = 54.

4. £71. 5*s.* = 17100*d.*
£1 + 1 crown + 1 half-crown + 1*s.* = 240*d.* + 60*d.* + 30*d.* + 12*d.*
= 342*d.*
∴ No. of each coin = 17100 ÷ 342 = 50.

5. 4 ac. 1 ro. 34 po. = 714 po.
42 po. = 42 po.
∴ No. of allotments = 714 ÷ 42 = 17.

6. 10 m. = (10 × 1760 × 36) in. = 633600 in.
4 ft. 7 in. = 55 in. and 5 ft. 6 in. = 66 in.
∴ No. of turns fore-wheel makes = 633600 ÷ 55 = 11520.
..... hind-wheel ..... = 633600 ÷ 66 = 9600.
..... required ..... = 11520 − 9600 = 1920.

7. 4 cwt. 3 qrs. 14 lbs. = 546 lbs.
weight of two parcels = (6 + 8) lbs. = 14 lbs.
Now 546 ÷ 14 = 39;
∴ there are 39 parcels of each.

8. Cost of whiskey = 10 guineas = (210 × 12)*d.* = 2520*d.*
2*s.* 4*d.* = 28*d.*
No. of pints sold = 2520 ÷ 28 = 90,
No. of pints bought = 10 × 8 = 80;
∴ No. of pints of water to be added = 10.

9. £8. 10*s.* = 2040*d.*
∴ daily wages = 2040*d* ÷ 6 = 340*d.*
1*s.* 10*d.* + 1*s.* = 2*s.* 10*d.* = 34*d.*
∴ No. required = 340 ÷ 34 = 10.

10. Stock of coals = (20 × 7 × 36 × 28) lbs. = 141120 lbs.
= (141120 ÷ 112) cwt. = 1260 cwt.
= (1260 ÷ 20) tons = 63 tons.
No. of 8lbs. of coals = 141120 ÷ 8 = 17640;
∴ cost of coals = (17640 × 3)*q* = 52920*q.* = £55. 2*s.* 6*d.*

Ex. XXVI. Page 92.

1. 1 horse + 1 saddle + 1 bridle = 178626*c.*
but 1 horse = 20 saddles + 20 bridles;
∴ 20 saddles + 20 bridles + 1 saddle + 1 bridle = 178626*c.*
or 21 saddles + 21 bridles = 178626*c.*
∴ 1 saddle + 1 bridle = (178626 ÷ 21)*c.* = 8506*c.*
∴ Horse = (8506 × 20)*c* = 170120*c.* = 1701*fr.* 20*c.*

2. Since 1 man = 2 women,
∴ 18 men + 22 women = 18 men + 11 men = 29 men;
∴ share of each man = (203 ÷ 29) litres = 7 litres,
and share of each woman = (7 ÷ 2) litres = 3 litres 5 décil.

3. 39 kilog. 6 décag. = 3906 décag.
each child ate (3906 ÷ 93) décag. = 42 décag.
= 4 hectog. 2 décag.

4. 1185 hectol. 60 litres = 118560 litres;
∴ each sack contained (118560 ÷ 120) litres = 988 litres.

5. In 366 days the gentleman may spend (1957450 − 100000)*c.* or 1857450*c.*

∴ he may spend daily (1857450 ÷ 366)*c.* or 5075*c.* or 50*fr.* 75*c.*

6. 1 man = 3 women, ∴ 2 men = 6 women;
∴ 7 men + 6 women = 7 men + 2 men = 9 men;
∴ each man's share = (5535 ÷ 9)*c.* = 615*c* = 6*fr.* 15*c.*
each woman's share = 6*fr.* 15*c* ÷ 3 = 2*fr.* 5*c.*

Ex. XXVII. Page 93.

1. 86 lit. 40 centil. = 8640 centil.
60 centil. = 60 centil.
∴ No. of bottles = 8640 ÷ 60 = 144.

2. 390 stères = 3900 décist.
32 stères 5 décist = 325 décist.
∴ No. of labourers = 3900 + 325 = 12.

3. Value of sugar = (135 × 700)*c.* = 94500*c.*
1 kilog. of tea = 875*c.*
∴ No. of kilog. req. = 94500 ÷ 875 = 108.

4. 1 Napoleon + 3 five-franc pieces + 19 francs
= (20 + 15 + 19) francs = 54 francs.

Now since 1404 ÷ 54 = 26, it follows that the bag contains 26 Napoleons, 26 × 3 or 78 five-franc pieces, and 26 × 19 or 494 francs.

BILLS OF PARCELS OR INVOICES.

Ex. XXVIII. Page 94.

1. W. Godfrey, Esq.

To W. Stafford.

1864				£	*s.*	*d.*
March 1.	15½ lbs.	of Beef	at 7½*d.* per lb...	0	9	8½
	7 ,,	Suet	at 6*d.* ,, ...	0	3	6
3.	10 ,,	Veal	at 8*d.* ,, ...	0	6	8
	17 ,,	Pork	at 7½*d.* ,, ...	0	10	3½
5.	13½ ,,	Mutton	at 8*d.* ,, ...	0	9	0
6.	3½ ,,	Beef Steaks	at 10½*d.* ,, ...	0	3	0¾
	3 Kidneys, at 1½*d.* each.....			0	0	4½
				2	2	6¾

2. Rev. Barnard Smith

Bought of Finch and Co.

1864		£	*s.*	*d.*
Feb. 29.	12 lbs. Best Loaf Sugar at 6½*d.* per lb....	0	6	6
	10 ,, Crystallized ,, at 5¾*d.* ,, ...	0	4	9½
	6½ ,, Finest Sultanas at 9*d.* ,, ...	0	4	10½
	2¼ ,, Tapioca at 10*d.* ,, ...	0	2	1
	2¾ ,, Arrowroot at 2*s.* ,, ...	0	5	6
	2 qts. Split Peas at 6*d.* per qt. ...	0	1	0
	Hamper.....	0	2	0
		1	6	9

3. John Sheild, Esq.

To Robert Hawthorn.

1863		£	*s.*	*d.*
Dec. 1.	750 Envelopes at 9*d.* per 100.....	0	5	7½
	1½ dozen Penholders at 3½*d.* per doz.....	0	0	5¼
	5 boxes of Gillott's Steel Pens at 1*s.* 6*d.* a box.....	0	7	6
	15 Penknives at 10½*d.* each.....	0	13	1½
5.	2 reams of Note Paper at 4½*d.* per quire	0	15	0
	250 Official Envelopes at 2*s.* per 100.....	0	5	0
	⅓ ream of Foolscap at 10½*d.* per quire. ...	0	8	9
		2	15	5¼

4. The Rev. W. Thompson

To J. Reeve.

1864		£	*s.*	*d.*
April 26.	5 tons of Coals at 15*s.* 6*d.* per ton...	3	17	6
	Carriage of do. at 2*s.* 6*d.* ,, ...	0	12	6
	2 trucks of Gravel (11½ tons) ..... at 5*s.* ,, ...	2	17	6
	Carriage of do. at 2*s.* 6*d.* ,, ...	1	8	9
May 1.	7 qrs. of Oats at 4*s.* 5*d.* per bus. ...	12	7	4
	37 bus. of Beans at 4*s.* 6*d.* ,, ...	8	6	6
	34 ,, of Peas at 4*s.* 8*d.* ,, ...	7	18	8
		37	8	9

5. Miss Palmer

To Hopkins and Co.

1864		£	*s.*	*d.*
May 3.	12½ yds. of Flannel at 1*s.* 6*d.* per yd.	0	18	9
	37 „ of Calico at 1*s.* 0½*d.* „	1	18	6½
	21 „ of Muslin at 2*s.* 4¾*d.* „	2	10	3¾
	18 „ of Linen at 2*s.* 6*d.* „	2	5	0
	13 „ of Ribbon at 10½*d.* „	0	11	4½
	Half-a-dozen pairs of Gloves at 2*s.* 9*d.* per pair.....	0	16	6
		9	0	5¾

6. The Rev. B. Brown

Bought of Moore Brothers and Co.

1864		£	*s.*	*d.*
March 8.	11¼ lbs. Good Servants' Tea at 3*s.* 2*d.* per lb.	1	15	7½
	16½ lbs. Souchong Tea at 3*s.* 6*d.* per lb.	2	17	9
	8 „ Mysore Coffee at 1*s.* 7*d.* „ ...	0	12	8
	10½ „ Best W. India Coffee at 1*s.* 5*d.* per lb.....	0	14	10½
	10¾ lbs. Choice Mocha Coffee at 1*s.* 6*d.* per lb.....	0	16	1½
	Box, 1*s.* 6*d.*, Booking, 2*d.*.....	0	1	8
		6	18	8½

7. W. Belgrave, Esq.

To William Irvine.

1864		£	*s.*	*d.*
May 1.	73 ft. of stout Pipe at 6¼*d.* per ft.....	1	19	6½
	18 Joints at 1*s.* 8*d.* each.....	1	2	6
	37 Pipe hooks at 1½*d.* „ ...	0	4	7½
	157½ yds. of wire fence at 2*s.* 1*d.* per yd.	16	8	1½
	Time, 4 men, each 2 days, at 3*s.* 6*d.* ...	1	8	0
		21	2	9½

8. Mrs Osborn

To Mrs Tooley.

1864		£	*s.*	*d.*
Feb. 6.	7 doz. and 4 Eggs at 9*d.* per doz.	0	5	6
	19 lbs. of Soap at 5½*d.* per lb.	0	8	8½
	18 „ Butter at 1*s.* 2*d.* „	1	1	0
	13½ „ Cheese at 7½*d.* „	0	8	5¼
	5 „ Bacon at 10*d.* „	0	4	2
	8 four-lb. Loaves at 4½*d.* each	0	3	0
	½ lb. of Pepper at 1¼*d.* per oz.	0	0	10
		2	11	7¾

9. George Dennis, Esq.

Bought of W. Compton.

1863		£.	s.	d.
May 24.	5½ doz. of Brown Sherry at 43*s.* 6*d.* per doz.	11	19	3
	13 doz. of Port at 48*s.* per doz.	31	4	0
	7½ ,, Dublin Stout at 6*s.* per doz.	2	5	0
Sept. 19.	1 doz. and 9 bot. of Gin at 2*s.* 7*d.* per bottle	2	14	3
	57 bot. of Brandy at 75*s.* per doz.	17	16	3
	Bottles, 2*s.* per doz.	3	5	0
		69	3	9

10. (1)

	£	s.	d.
67¼ ft. of window sashes at 9½*d.* per ft. =	2	13	5½
154 cub. ft. of oak at 4*s.* 7½*d.* per cub. ft. =	35	15	5½
245 ft. of ash at 8½*d.* per ft. =	8	8	5½
127½ ft. of framed deal at 3½*d.* per ft. =	1	17	2½
701½ ft. of mahogany at 1*s.* 10½*d.* per ft. =	65	15	3¾
5¾ cwt. of nails at 8*s.* a stone =	18	8	0
	132	17	10

(2)

	c.
52 hectol. 25 lit. of wine at 2 *fr.* 45*c.* a litre =	1280125
18 hectol. of wheat at 18 *fr.* 25*c.* a hectol. =	32850
A quintal of sugar at 1 *fr.* 5*c.* a kilog. =	10500
135 m. 50 centim. of plank at 1 *fr.* 20*c.* =	16260
22 stères, 5 décist. of wood at 17 *fr.* 50*c.* a stère =	39375
	1379110*c.*

= 13791 *fr.* 10*c.*

(3)

	£	s.	d.
8¼ dozen razors at 1*s.* 3½*d.* each =	6	11	9
6 dozen ditto at 13*d.* each =	3	18	0
4 dozen and 9 ditto at 11½*d.* each =	2	15	9¾
10 dozen knives and forks at 2½ guineas per dozen =	26	5	0
5¼ dozen ditto at £1. 7*s.* 9*d.* a dozen =	7	12	7¾
7 files at 3½*d.* each =	0	2	0¾
3 saws at 3*s.* 8*d.* each =	0	11	0
9 paint brushes at £2. 3*s.* per dozen =	1	12	3
	49	8	5¾

		£	s.	d.
(4)	263 sq. yds. of painting, graining and varnishing, oak pattern, at 2*s.* 7½*d.* per sq. yd.	= 34	10	4½
	55⅔ sq. yds. of ditto, maple pattern, at 3*s.* 8*d.* per sq. yd.	= 10	4	5
	135½ ft. of outside painting, piping and cornice, at 8½*d.* per ft.	= 4	15	11¾
	13½ dozen sashes at 2*s.* 5½*d.* per dozen	= 1	13	2¼
	562 ft. of glass in new sashes at 7¾*d.* per ft.	= 18	2	11½
	2½ cwt. of putty at 3½*d.* per lb. . . .	= 4	1	8
	56 lbs. of white lead at 36*s.* a cwt. . .	= 0	18	0
	5 men's labour for 27½ days at 3*s.* 6*d.* each a day	= 24	1	3
		98	7	10

Ex. XXIX. Page 98.

MISCELLANEOUS QUESTIONS AND EXAMPLES.

I.

2. (1) 10010.

```
      10010
          3
  4 | 30030
 12 |  7507 rem. 2q.
2,0 |  62,5 rem. 7d.
      ------
       31  rem. 5s.
```

Ans. £31. 5*s.* 7½*d.*

(2) 7034097.

```
       7034097
             2
16 { 4 | 14068194
   { 4 |  3517048 rem. 2 }  2 oz.
28 { 4 |   879262 rem. 0 }
   { 7 |   219815 rem. 2 }  6 lbs.
     4 |    31402 rem. 1 }
2,0  |      785,0 rem. 2 qrs.
       ------
        392 rem. 10 cwt.
```

Ans. 392 tons 10 cwt. 2 qrs. 6 lbs. 2 oz.

3. $1700 + 2012 + 395 = 4107$,
and $52 \times 64 = 3328$;
$\therefore$ Ans. $= 4107 - 3328 = 779$.

4.

$$67 \overline{)2000} \ (29$$
$$134$$
$$660$$
$$603$$
$$57$$

$\therefore$ 57 of the children each receive (29 + 1) or 30 plums, and 10 each 29 plums.

5.

$$2549511399$$
$$2453198761$$
$$96312638$$
$$9\tfrac{1}{2}$$
$$866813742$$
$$48156319$$
$$12 \ | \ 914970061 \ d.$$
$$2{,}0 \ | \ 7624750{,}5 \text{ rem. } 1d.$$
$$3812375 \text{ rem. } 5s.$$

Ans. £3812375. 5*s.* 1*d.*

6. (1) 86 pairs of boots sell for 1493 *fr.* 50*c.* or for 149350*c.*
30 ..... 15*fr.* 25*c.* × 30, or for 45750*c.*

$\therefore$ the remaining 56 pairs are valued at 149350*c.* − 45750*c.*
or 103600*c.*

$\therefore$ 1 pair of boots is valued at 103600*c.* ÷ 56 = 1850*c.* or 18*fr.* 50*c.*

(2)

	£	£
23128518)	301380730	(13
	23128518	
	70095550	
	69385554	
	709996	
	20	
	14199920	
	12	
23128518)	170399040	(7*d.*
	161899626	
	8499414	
	4	
23128518)	33997656	(1*q.*
	23128518	
	869138	

Ans. £13. 0*s.* 7¼*d.* nearly.

(3) £54. 15*s.* 6*d.* × 5 = £273. 17*s.* 6*d.* sum coll. in 1st 5 mo.
£63 × 3 = £189. 0*s.* 0*d.* sum coll. in next 3 mo.
∴ £462. 17*s.* 6*d.* sum coll. in 1st 8 mo.;

∴ £600 − £462. 17*s.* 6*d.* = £137. 2*s.* 6*d.* sum to be collected in last 4 months;

∴ £137. 2*s.* 6*d.* ÷ 4 = £34. 5*s.* 7½*d.* sum to be collected in each of the last 4 months.

Average monthly collection = £600 ÷ 12 = £50.
..... weekly ..... = £600 ÷ 52 = £11. 10*s.* 9½*d.* nearly.

7. (1) Weight of 34 sacks = 4 lbs. 8 oz. × 34 = 153 lbs.;
∴ weight of potatoes in 34 sacks = (510 × 14 − 153) lbs.
= (7140 − 153) lbs. or 6987 lbs.;
∴ weight of potatoes in each sack
= 6987 lbs. ÷ 34 = 205 lbs. 8 oz.

4*s.* ÷ 3*d.* = 48*d.* ÷ 3*d.* = 16;

∴ No. of lbs. required = 112 ÷ 16 = 7.

(2) Weight of loaves = (940 × 250) décag. = 235000 décag.
= 2350 kilog.;
∴ cost required = (175 × 2350)*c.* = 411250*c.* = 4112 *fr.* 50*c.*

		£	*s.*	*d.*
8.	14 doz. of sherry at 2 guineas a doz. .	= 29	8	0
	13½ doz. of port at 2½ guineas a doz. .	= 35	8	9
	10 doz. 4 bottles of claret at 7*s.* 6*d.* a bot.	= 46	10	0
	4½ gals. of gin at 2*s.* 6*d.* a bottle . . .	= 3	7	6
	1⅔ doz. of whiskey at 23*s.* 6*d.* a gal. . .	= 4	2	3
	17 doz. of porter at 7*d.* a bottle less 2*s.* a doz. for returned bottles .	= 4	5	0
		= 123	1	6

II. Page 99.

1. Ans. = 50000 − 50 = 49950.

2. (1)

$$
\begin{array}{r|l}
4009 & 19094867 \\
 & 16036 \\
\hline
 & 30588 \quad *(1) \\
 & 28063 \\
\hline
 & 25256 \quad *(2) \\
 & 24054 \\
\hline
 & 12027 \\
 & 12027 \\
\hline
\end{array}
$$

* from (1) we see that $3058867 \div 4009 = 763$,

* ..... (2) ..... $252567 \div 4009 = 63$.

(2) 4 doz. of wine at 3 *fr.* 35*c.* a bottle
$= (335 \times 48)c. = 16080c.$;

$\therefore$ value of 35 bottles of brandy
$= (16080 - 1240)c. = 14840c.$;

$\therefore$ value of a bottle of brandy $= 14840c. \div 35 = 424c.$
$= 4\,fr.\ 24c.$

3. (1) 46 m. 75 centim. $= 46750$ millim.;

$\therefore$ No. of pieces of money $= 46750 \div 2 = 23375$;

value in English money $= (23375 \times 5 \times 10)d.$
$= £4869.\ 15s.\ 10d.$

(2) No. of treads $= 20 + 16 \times 2 + 12 \times 3 = 20 + 32 + 36 = 88$;

$\therefore$ Ans. $= (88 \times 9)$ in. $= 792$ in. $= 66$ yds.

4. (1) Bankrupt's assets $= (12s.\ 0\tfrac{1}{2}d. \times 5760) = £3468.$

On each £ creditor loses £1 − 12*s.* $0\tfrac{1}{2}d. = 7s.\ 11\tfrac{1}{2}d.$;

$\therefore$ on £48. 10*s.* he loses $7s.\ 11\tfrac{1}{2}d. \times 48\tfrac{1}{2} = £19.\ 5s.\ 11\tfrac{3}{4}d.$

(2)

	£
Gentleman's gross income =	5192
Taxes &c. = $7s.\ 6d. \times 5192 =$	1947

Gentleman's *net* income = £5192 − £1947 = £3245.

Again £3245 − £500 = £2745;

$\therefore$ he may spend daily £2745 ÷ 366 = £7. 10*s.*

5. (1) Weight of 40 litres of liquid = (405 − 39) hectog.
= 366 hectog.
= 36600 gr.;

∴ weight of a litre of liquid = 36600 gr. ÷ 40
= 915 gr.

(2) 38 kilog. of candles at 1 *fr.* 30 *c.* = (130 × 38) *c.* = 4940 *c.*;
∴ cost of oil = (8690 − 4940) *c.*
= 3750 *c.*;
∴ No. of kilog. of oil = 3750 ÷ 150 = 25.

(3) Since 4 myriam. = 40 kilom. = distance travelled in 1 hr.
time required = (272 ÷ 40) hrs. = 6 hrs. 48′,
rate per hour in 2nd case = 272 kilom. ÷ 20
= 2720 hectom. ÷ 20
= 136 hectom.;

∴ Answer = (400 − 136) hectom. = 264 hectom.
= 2 myriam. 6 kilom. 4 hectom.

6. 15 half-crowns = £1. 17*s.* 6*d.* = 450*d.*

Now 20 children in 1st division = 40 children in 2nd,
..... 120 ..... 3rd ..... = 60 .....

∴ 20 children in 1st + 50 children in 2nd + 120 children in 3rd
= (40 + 50 + 60) children in 2nd = 150 children in 2nd;

∴ each child in 2nd division receives 450*d.* ÷ 150 = 3*d.*
..... 1st ..... 3*d.* × 2 = 6*d.*
..... 3rd ..... 3*d.* ÷ 2 = 1½*d.*

7. Attendance on Monday = 87
..... Tuesday = 82
..... Wednesday = 95
..... Thursday = 89
..... Friday = 82
5 | 435
87 is the average attendance.

8. (1)

		c.
27½ m. of linen at 3*fr.* 50*c.* a m.	=	9625
6¼ m. of velvet at 17*fr.* a m.	=	10625
29 m. of brocade at 16*fr.* 75*c.* a m. . .	=	48575
28¾ m. of merino at 4*fr.* a m.	=	11500
1½ doz. pairs of stockings at 3*fr.* 5*c.* a pair	=	5490
7 pairs of gloves at 42*fr.* a doz. pairs .	=	2450
		88265
	=	882*fr.* 65*c.*

Sum of shares = 2 + 5 + 7 + 1 = 15;

∴ value of each share = 35000 guineas ÷ 15 = £36750 ÷ 15
= £2450;

∴ *A* invests £4900, *B* £12250, *C* £17150, and *D* £2450.

Each share ought to receive £2881 ÷ 15 = £192. 1*s.* 4*d.*

∴ *B* ought to receive £192. 1*s.* 4*d.* × 5 = £960. 6*s.* 8*d.*

Ex. III. Page 101.

1. (1) MDCCCLII.

(2)
365027045
84206
364942839 = number required.

2. (1)
129847
468
1038776
779082
519388
60768396

If the figures be shifted as directed by the question, the numbers will be 129847 and 40068.

(2)
219) 3417495 (15605
219
1227
1095
1324
1314
1095
1095

Now by question,

No. + one-fourth of No. = 15605;

∴ four-fourths of No. + one-fourth of No. = 15605;

∴ five-fourths of No. = 15605;

∴ one-fourth of No. = 15605 ÷ 5 = 3121;

∴ No. = 3121 × 4 = 12484.

3. 1 private in all the classes of cavalry costs

£55. 6*s.* 1½*d.* + £68. 16*s.* 8½*d.* + £63. 14*s.* 2½*d.*

+ £52. 11*s.* 3½*d.*

or £240. 8*s.* 4*d.*;

∴ 3000 privates cost £240. 8*s.* 4*d.* × 3000 = £721250.

1 private in all the classes of infantry costs £32. 6*s.* 11½*d.*

+ £28. 17*s.* 7¾*d.* + £26. 3*s.* 5½*d.*

or £87. 8*s.* 0¾*d.*;

∴ 5000 privates cost £87. 8*s.* 0¾*d.* × 5000 = £437015. 12*s.* 6*d.*

∴ sum of money to be voted = £721250 + £437015. 12*s.* 6*d.*

= £1158265. 12*s.* 6*d.*

4. (1)

$$55\left\{\begin{array}{l|l} 11 & 329744 \\ 5 & \underline{29976} \text{ rem. } 8 \\ & \underline{5995} \text{ rem. } 1 \end{array}\right\} 19$$

Quotient is 5995 rem. 19.

(2) Suppose *A* to have 2 shares, then *B* will have

(2 + ½ of 2) shares, or (2 + 1) or 3 shares;

∴ value of each share = £65. 10*s.* ÷ 5 or £13. 2*s.*;

∴ *A* has to receive £13. 2*s.* × 3 = £39. 6*s.*

B..... £13. 2*s.* × 2 = £26. 4*s.*

5. 1760 ÷ 16 = 110;

∴ No. of seconds in which 1st boy runs a mile

= 110 × 5 = 550

= 9 min. 10 sec.

In 1 sec., 2nd boy will run 48 ft. ÷ 6 or 8 ft.;

∴ in 550 sec., ... (8 × 550) ft. or 4400 ft.;

∴ 2nd boy will be behind at the finish = (5280 − 4400) ft.

= 880 ft.

6. (1) Cask of wine weighs 3022920 décig.
Cask itself ..... 240000 décig.
∴ wine ..... 2782920 décig.;
∴ No. of litres required = 2782920 ÷ 9939 = 280.

(2) 1 bottle contains $1\frac{1}{2}$ pints;
∴ 12 bottles contain $(1\frac{1}{2} \times 12)$ or 18 pints;
∴ $15\frac{1}{2}$ dozen contain $(18 \times 15\frac{1}{2})$ or 279 pints;
∴ No. of pints of beer not bottled
$= (54 \times 8 - 279)$ or 153 pints,
price of doz. of bottled beer less price of a dozen bottles
$= 7s. - 1s.\ 3d. = 5s.\ 9d.$;
∴ price realized by sale of beer $= 5s.\ 9d. \times 15\frac{1}{2} + 2\frac{1}{2}d. \times 153$
$= £4.\ 9s.\ 1\frac{1}{2}d. + £1.\ 11s.\ 10\frac{1}{2}d.$
$= £6.\ 1s.$;
∴ gain $= £6.\ 1s. - £4.\ 4s. = £1.\ 17s.$

(3) By the question,
2 gallons of claret cost 18*s.*;
∴ 36 ..... (18×18) or 324*s.* or £16. 4*s.*;
∴ 126 gallons of the mixture cost £84 + £16. 4*s.* = £100. 4*s.*

But 126 gallons at 2*s.* 3*d.* a pint
$= (2s.\ 3d. \times 126 \times 8) = £113.\ 8s.$;
∴ gain $= £113.\ 8s. - £100.\ 4s.$
$= £13.\ 4s.$

7. (1) $B + C + D$ receive 26600*c.* − 9085*c.* or 17515*c.*
Now since B and C each receive a Napoleon more than D,
B's + C's + D's receipts less 2 Napoleons will = 3 times as much as D receives;
∴ $(17515 - 4000)$ or 13515*c.* = 3 times D's receipts;
∴ 13515*c.* ÷ 3 or 4505*c.* or 45*fr.* 5*c.* = D's receipts.

(2) $13 + 29 + 0 + 43 + 72 + 35 = 192$;
∴ average $= 192 \div 6 = 32$.

8. (1)

		grs
24	6	97920
	4	16320
2,0		408,0 dwts.
12		204 oz.
		17 lbs.

(2)

342438
313647
9) 28791
3199 oz.

Average excess in weight = 3199 oz.

Excess in value = £3. 17*s.* 10½*d.* × 3199
= (3738 × 3199)*q.*
= 11957862*q.*
= £12456. 2*s.* 1½*d.*

Ex. IV. Page 103.

1. (1) No. of times = 2338268 ÷ 346 = 6758.

(2) Total increase = 16854142 − 14995132 = 1859010.
Average increase = 1859010 ÷ 10 = 185901.

(3) 354160 lbs. = (354160 × 12) oz. = 4249920 oz.
∴ value of an ounce of gold = £16548126 ÷ 4249920
= £3. 17*s.* 10½*d.*

2. 432 lbs. of tea at 3*s.* 8½*d.* a lb. = (3*s.* 8½*d.*) × 432 = £80 2*s.* 0*d.*

	£	*s.*	*d.*
360 lbs. at 4*s.* 3½*d.* = (4*s.* 3½*d.*) × 360 =	76	17	6
72 lbs. at 1*s.* 10½*d.* = (1*s.* 10½*d.*) × 72 =	6	13	6
	83	11	0

∴ gain = £83. 11*s.* − £80. 2*s.* = £3. 9*s.*

3. No. of days = 371,
∴ No. of seconds = 371 × 24 × 60 × 60 = 32054400.

4. (1) In 6 days 12 men, 24 women, and 30 children earn £25. 13*s.*,

∴ in 1 day they earn £25. 13*s.* ÷ 6 or £4. 5*s.* 6*d.* or 1026*d.*

Now 1 man = 3 children, and 1 woman = 2 children,

∴ 12 men = 36 children, and 24 women = 48 children;

∴ in 1 day 36 children, 48 children, and 30 children earn 1026*d.*,
or in 1 day 114 children earn 1026*d.*,
or in 1 day 1 child earns 1026*d.* ÷ 114 or 9*d.*;
∴ 1 man earns 9*d.* × 3 = 2*s.* 3*d.*
and 1 woman earns 9*d.* × 2 or 1*s.* 6*d.*

(2) 2 No. of votes polled by the losing Candidate = 2163 − 195
= 1968,
∴ No. of votes polled by the losing Candidate = 984,
∴ No. ..... winning ..... = 984 + 195
= 1179.

5. (1) 340 ares of land cost 12500 francs,

∴ in order to gain 1100 francs, 340 ares must be sold for 13600 francs.

∴ 1 are must be sold for 13600 francs ÷ 340 or 40 francs,

∴ 1 hectare ..... (40 × 100) or 4000 francs.

(2)

ac.	po.	yds.
16	21	$4\frac{3}{4}$
4		
64 ro.		
40		
2581 po.		
	$30\frac{1}{2}$	
77430		
	$645\frac{1}{2}$	
	$4\frac{3}{4}$	
78080 yds.		

po.	yds.
16	4
	$30\frac{1}{2}$
484	
	4
488 yds.	

∴ No. of gardens = 78080 ÷ 488
= 160

(3) 40000 francs a hectare = 400 francs an are.

Lots 1 and 2 contain (7940 + 5025) or 12965 ares,

∴ Lot 3 contains (17000 − 12965) or 4035 ares;

	fr.
∴ Lot 1 sold for (7940 × 40) *fr.*	= 317600
Lot 2 ..... (5025 × 35) *fr.*	= 175875
Lot 3 ..... (4035 × 30) *fr.*	= 121050
∴ farm sold for . . .	614525 francs

∴ there is a gain of (614525 − 500000) *fr.* or 114525 francs.

6.

	£	*s.*	*d.*
Money Rent = (400 × 5)*s.* . . =	100	0	0
100 qrs. of wheat at £2. 9*s.* 6*d.* =	247	10	0
75 qrs. of barley at £1. 10*s.* 8*d.* =	115	0	0
60 qrs. of oats at 19*s.* 2*d.* . . =	57	10	0
	520	0	0

∴ average rent per acre = £520 ÷ 400
= £1. 6*s.*

7. (1) 4 thalers + 12 dollars + 10 florins + 3 guineas = £7. 2*s.*

∴ 4 thalers = £7. 2*s.* − (12 dollars + 10 florins + 3 guineas)
= £7. 2*s.* − (4*s.* 2*d.* × 12 + 2*s.* × 10 + £3. 3*s.*)
= £7. 2*s.* − (£2. 10*s.* + £1 + £3. 3*s.*)
= £7. 2*s.* − £6. 13*s.*
= 9*s.*

∴ 1 thaler = 9*s.* ÷ 4 = 2*s.* 3*d.*

(2) 3 kilog. cost 250*c.* + 260*c.* + 290*c.* or 800*c.*

∴ No. of kilog. of each kind = 7200 ÷ 800
= 9.

8. During the month of May a daily visitor would pay

£2 + 5*s.* × 12 + 2*s.* 6*d.* × 10 + 5*s.* × 2,

or £2 + £3 + £1. 5*s.* + 10*s.* or £6. 15*s.*

The Exhibition was open for 20 weeks after the month of May; during that time a daily visitor would pay

{1*s.* × 4 + 2*s.* 6*d.* × 2} × 20 + £3, less 2*s.* 6*d.* × 3

= £12 − 7*s.* 6*d.* = £11. 12*s.* 6*d.*

∴ a daily visitor would pay in all £6. 15*s.* + £11. 12*s.* 6*d.* or £18. 7*s.* 6*d.*;

∴ by taking a season ticket he would save £18. 7*s.* 6*d.* − £3. 3*s.* or £15. 4*s.* 6*d.*

Ex. V. Page 105.

1. (1) 1st number = 3453,
2nd number = 3453 − 558 = 2895,
3rd number = 3453 × 558 ÷ 54 = 35681,
sum = 3453 + 2895 + 35681 = 42029.

(2) Product = 367 × (367 + 58) = 367 × 425 = 155975.

$$425 \overline{)32647} \quad 76$$
$$2975$$
$$\overline{2897}$$
$$2550$$
$$\overline{347}$$

425 − 347 = 78

∴ number required = 32647 + 78 = 32725.

(3) No. of kilog. of hay eaten by 6 horses in 1 day = 180 ÷ 4 = 45,
∴ No. of hectog. ..... = 450,
∴ ..... 1 ..... = 450 ÷ 6 = 75,
∴ ..... 15 ..... = 75 × 15,
∴ ..... 15 ..... 7 days = 75 × 15 × 7
= 7875
= 787 kilog. 5 hectog.

2. (1) He has (75000 − 24855) or 50145 décist. to sell.
The wood costs (1950 × 7500) or 14625000*c*.
The wood sells for (314 × 50145) or 15745530*c*.,
∴ he gains 1120530*c*. or 11205*fr*. 30*c*.

(2) No. of cubic feet of brickwork = 140 − 54 = 86,
∴ ..... in. ..... = 86 × 12 × 12 × 12
or 148608,
∴ No. of bricks required = 148608 ÷ 108 = 1376.

3. (1) If 112 lbs. cost 126*s*.
1 lb. cost 126*s*. ÷ 112 = 1*s*. 1$\frac{1}{8}$*d*.
∴ 100 lbs. cost 1*s*. 1$\frac{1}{8}$*d*. × 100 = £5. 12*s*. 6*d*.
∴ the latter way is the best to purchase.

The loss is 2*d*. on 100 lbs.
∴ the loss is (2 × 120)*d*. or £1 on (100 × 120) lbs.
or on 5 tons 7 cwt. 16 lbs.

(2) 1 sou + 1 half-franc + 1 franc + 1 5-franc + 1 Napoleon
$= (5 + 50 + 100 + 500 + 2000)c. = 2655c.$
and 3371 *fr.* 85*c.* = 337185*c.*
∴ No. required = 337185 ÷ 2655 = 127.

4. (1) Father's age − son's age = 27 years,
or 4 times son's age − son's age = 27 years,
or 3 times son's age = 27 years,
∴ son's age = 9 years,
∴ father's age = 9 years × 4 = 36 years.

(2) On leaving London, he travels (44 × 20) or 880 ft. in a minute,
25 mi. = (25 × 1760 × 3) ft. = 132000 ft.;
∴ 132000 ÷ 880 or 160 m. or 2 hr. 30 m. is the time taken in travelling the 25 mi.

He then travels 748 ft. in a minute,
51 mi. = (51 × 1760 × 3) ft. = 269280 ft.;
∴ 269280 ÷ 748 or 360 m. or 6 hrs. is the time taken in travelling the 51 mi.

∴ he takes 8 hrs. 30 m. to travel 76 mi.; or he reaches the end of the 76 mi. at 3 o'clock P.M.

∴ he has 15 mi. or (15 × 1760 × 3 = 79200) ft. to travel in 75 minutes;

∴ in 1 minute he must travel 79200 ft. ÷ 75, or 1056 ft.

∴ he must quicken his pace (1056 − 748) ft. or 308 ft. per minute.

5. (1) 25 lambs cost 91525*c.*
30 lambs cost 142075*c.*;
∴ 55 lambs cost 233600*c.*
55 lambs sell for (4305 × 55)*c.* or 236775*c.*;
∴ gain = (236775 − 233600)*c.* = 3175*c.* = 31 *fr.* 75*c.*

(2)

	£	*s.*
60 yds. of cloth cost	12	12
70	10	10
∴ 130	23	2

Now 21*s.* ÷ 6 = 3*s.* 6*d.* is the selling price per yd.
∴ the cloth is sold for 3*s.* 6*d.* × 130, or £22. 15*s.*
∴ loss = £23. 2*s.* − £22. 15*s.*
= 7*s.*

6. (1) In Rutland,
to 95805 acres there are 21859 people,
∴ to 1 acre ..... 21859÷95805...
∴ to 640 ac. or 1 sq. mi. ..... 21859 × 640÷95805...
=146 nearly.

In Northampton,
to 630358 acres there are 227727 people,
∴ to 1 acre ..... 227727÷630358...
∴ to 640 ac. or 1 sq. mi. ..... 227727 × 640÷630358...
=231 nearly.

∴ Northampton has 231 − 146, or 85 more people on the average than Rutland to the square mile.

(2) $6\frac{1}{2}$ mi. = (1760 × $6\frac{1}{2}$) yds. = 11440 yds.
∴ No. of chains in $6\frac{1}{2}$ mi. = 11440÷220 = 520,
∴ cost = 1*s.* $4\frac{1}{4}$*d.* × 520 = £35. 15*s.*

7. (1) 3 tons, 3 cwt. = 7056 lbs., and 5 tons, 7 cwt. 16 lbs. = 12000 lbs.

7 fires in 28 days of 9 hrs. each consume 7056 lbs.,
or 7 fires in 252 hrs. consume 7056 lbs.;
∴ 1 fire in 252 hrs. consumes 7056 ÷ 7 or 1008 lbs.;
∴ 1 fire in 1 hr. consumes 1008 ÷ 252, or 4 lbs.;
∴ 15 fires in 1 hr. consume 4 × 15, or 60 lbs.;
∴ 15 fires in 1 day of 10 hrs. consume 60 × 10, or 600 lbs.;
∴ No. of days required = 12000÷600 = 20.

(2)

		£	*s.*	*d.*
Income-tax = (741 × 6*d.*)	=	18	10	6
Expenditure = (£1. 11*s.* 6*d.* × 365)	=	574	17	6
∴ total outgoings	=	593	8	0

∴ saving = £741 − £593. 8*s.* = £147. 12*s.*

(3) £741 = (741 × 20 × 2) sixpences = 29640 sixpences,
and 29640 ÷ 39 = 760 sixpences.

For every 19*s.* 6*d.* which he has after paying the tax he had £1 before he paid it;
∴ for every 39 sixpences now he had 40 sixpences before;
..... 39 × 760, or 29640 sixpences now he had (40 × 760) sixpences before;
..... £741 now he had £760.

8. (1) By the question,

1 second-class ticket = 2 third-class;

$\therefore$ 2 ..... = 4 .....

Also 1 first-class ticket = 2 second-class;

$\therefore$ 3..... = 6 .....

= 12 third-class.

By the question,

(3 first + 2 second + 1 third) class tickets cost £5. 6*s.* 3*d.*,

or (12 third + 4 third + 1 third) class tickets cost £5. 6*s.* 3*d.*, or 1275*d.*,

or 17 third-class tickets cost 1275*d.*;

$\therefore$ 1 third-class ticket cost 1275*d.* $\div$ 17 or 75*d.*, or 6*s.* 3*d.*;

$\therefore$ 1 second-class ticket cost 6*s.* 3*d.* $\times$ 2 = 12*s.* 6*d.*, and one first-class ticket cost 12*s.* 6*d.* $\times$ 2 = £1. 5*s.*,

rate per mile for the second-class = 150*d.* $\div$ 100 = $1\frac{1}{2}$*d.*

(2) His yearly expenditure amounts to
$(250000 + 14915 \times 52)c.$, or 1025580*c.*;

$\therefore$ he may increase his yearly expenditure by
$(1463680 - 1025580)c.$, or by 438100*c.*;

$\therefore$ he may increase his weekly expenditure by
438100*c.* $\div$ 52, or by 8425*c.*, or by 84*fr.* 25*c.*

(3) He walks per hour $(108 \times 30 \times 60)$ in. = 194400 in.
= 3 mi. 120 yds.

(4) Since to 1 man there are 2 women and 6 children,

and since there are 72 in all, $72 \div (1 + 2 + 6)$ or $9 = 8$ the No. of men;

$\therefore$ No. of women = 16, and No. of children = 48,

daily cost of inmates = £37 − 4*s.* $\div$ 31 = £1. 4*s.* or 288*d.*

By the question,

Cost of a man = cost of a woman + $1\frac{1}{2}$*d.*,

cost of 3 children = cost of a man + cost of a woman;

$\therefore$ daily cost of 8 men = daily cost of 8 women + $1\frac{1}{2}d.$ × 8
= daily cost of 8 women + $12d.$

$\therefore$ daily cost of 16 women = daily cost of 16 women;

$\therefore$ daily cost of 48 children = daily cost of 16 men and 16 women = daily cost of 32 women + $24d.$;

$\therefore$ daily cost of inmates = daily cost of 56 women + $36d.$;

$\therefore$ daily cost of 56 women = $(288 - 36)d.$
= $252d.$;

$\therefore$ daily cost of women = $252d. \div 56 = 4\frac{1}{2}d.$,

daily cost of a man = $4\frac{1}{2}d. + 1\frac{1}{2}d. = 6d.$,

daily cost of a child = $(6d. + 4\frac{1}{2}d.) \div 3 = 10\frac{1}{2}d. \div 3 = 3\frac{1}{2}d.$

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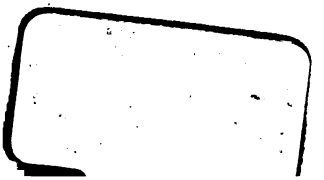
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